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Sentinel Surveys 1995-2007: Catch per Unit Effort in NAFO Divisions 2J3KL

Relevés sentinelles 1995-2007 – Prises par unité d'effort dans les divisions 2J3KL de l'OPANO

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Abstract

Data from the Sentinel program in NAFO Div. 2J3KL are summarized and updated with 2007 data. Mean gillnet (5½") catch rates (numbers of fish per net) in Div. 3K and 3L were relatively high in 1996 and 1997, increased to the highest value in 1998 and then decreased to 2003. Since then catch rates have trended upward from 2002 to 2007. In 2J, although catch rates in 5½" gillnet were very low in all years, they show a marked increase in 2005 and remain at similar levels through 2007. Small mesh gillnet catch rates have been more variable and trends are more difficult to discern, probably due to the ability of this gear to catch fish from two distinct size ranges. Linetrawl catch rates (number of fish per 1000 hooks) in Div. 3K and 3L showed similar trends to 5½" gillnet, decreasing from the late 90s to the early 2000s and then generally increasing in recent years. In 2006 and 2007, however, catch rates in Div. 3L dropped from the 2004-05 levels, and were the lowest catch rates in this Division for this gear. There has been no linetrawl activity in Div. 2J since 2001.

Spatially, catch rates have been variable from year to year and place to place. Higher catch rates have been most consistent from Happy Adventure to Little Catalina in 5½" gillnet, from Wesleyviille to Bay de Verde in small mesh gillnet and in linetrawl, high catch rates are more spatially widespread.

Résumé

Les données recueillies dans le cadre du programme sentinelle dans la division 2J3KL de l'OPANO sont résumées et on y a ajouté les données de 2007. Les taux de prises moyens au filet maillant (5 ½ po) (nombre de poissons par filet) dans les divisions 3K et 3L étaient relativement élevés en 1996 et 1997, les valeurs enregistrées ayant atteint le niveau le plus élevé en 1998 pour connaître par la suite une diminution jusqu'en 2003. De 2002 à 2007, les taux de prises affichent une tendance à la remontée. Dans 2J, bien que les taux de prises au filet maillant 5 ½ po aient été plutôt bas durant toutes ces années, ils ont marqué une augmentation en 2005 qui s'est maintenue à des niveaux similaires jusqu'en 2007. Les taux de prises au filet maillant à petites mailles ont été plus variables et les tendances sont plus difficiles à dégager, probablement en raison de la capacité de cet engin de pêche à prendre du poisson de deux fourchettes de dimensions distinctes. Les taux de prises à la palangre (nombre de poissons par 1 000 hameçons) dans les divisions 3K et 3L ont affiché des tendances similaires à celles des taux de prises au filet maillant 5 ½ po, diminuant de la fin des années 1990 au début des années 2000 pour afficher une augmentation générale au cours des années passées. Cependant, en 2006 et 2007, les taux de prises dans 3L ont chuté comparativement aux niveaux enregistrés en 2004-2005, et ils représentaient les taux les plus bas dans cette division pour cet engin de pêche. Aucune activité de pêche à la palangre n'a eu lieu dans la division 2J depuis 2001.

Spatialement, les taux de prises ont été variables d'année en année et d'un endroit à un autre. Les taux de prises les plus élevés ont été plutôt constants de Happy Adventure à Little Catalina au filet maillant 5 ½ po, et de Wesleyville à Bay de Verde au filet maillant à petites mailles; concernant la pêche à la palangre, les taux de prises les plus élevés ont été enregistrés sur une plus grande étendue.

INTRODUCTION

Sentinel survey projects were formally announced by the Minister of Fisheries and Oceans in October 1994. The surveys in the DFO Newfoundland and Labrador Region are an extension of the index fishermen's project from the Northern Cod Science Project Program with modifications to allow for science activities achievable only under a fishing moratorium. Sentinel data collection continued during the commercial/index fisheries that occurred from 1998 to 2002, and in 2006-07.

The sentinel survey has the following objectives:

1. To develop a catch rate series for use in resource assessments.
2. To incorporate the knowledge of inshore fishers in the resource assessment process.
3. To describe the temporal-spatial distribution of cod in the inshore area over a number of years through, for example, the use of catch rate information, tagging studies, by-catch information and fishers' observations.
4. To gather length frequencies, sex and maturity data and sample ages for use in resource assessment.
5. To establish a long-term physical oceanographic and environmental monitoring program of the inshore areas.
6. To provide a source of biological material for other researchers. For example, tissue for genetic, physiological and toxicological analyses, cod stomachs for food and feeding studies and by-catch information.

PARTICIPANTS

The primary collectors of data in the sentinel survey are inshore fishers. Through consultation with inshore fishers and fisheries organizations, traditional inshore fishing grounds have been identified and mapped.

Fishers from communities within the boundaries of the identified coastal areas and who met eligibility criteria were invited to apply to participate in the survey. Where more than one application was received from an area, the project partner conducted a draw or lottery to select the participant. While there was considerable interest in the project in most areas, there were many sites from which only one application was received and others where additional canvassing was required to enlist participants. Selected participants were required to complete a six-week course designed by the Marine Institute of Memorial University in consultation with DFO. Topics covered included scientific sampling methods and equipment, computer use, resource assessment basics and presentation skills.

In order to minimize inter annual enterprise effects on data collection, participants are expected to remain with the survey over a number of years. It is also expected that most of the sampling activities will continue once commercial fishing operations resume and the sentinel participants will form a core of index fishers.

SITES

In 2007, forty-three enterprises participated in sentinel activities in NAFO Div. 2J3KL (down from 57 or 58 prior to 2004). The specific location of each site was chosen after consultation between DFO scientists, fishermen, the Fish, Food and Allied Workers Union (FFAW) and the Fogo Island and Petty Harbour Cooperatives (for Fogo Island and Petty

Harbour). Site selection was based on the need to survey throughout inshore areas and targeted historical fishing areas and historical gear use patterns.

SAMPLING STRATEGY

Table 1 gives the homeport of the participants in the sentinel surveys; showing the number of sets completed in each year, the number of weeks allocated for sentinel activity, and the number of enterprises participating in the survey. The timing of sampling was determined after discussions with fishers but was targeted for seasonally appropriate times based on historical fishing patterns.

Gillnets and linetrawl were used to survey inshore areas in 2J3KL. Cod traps were used from 1998 to 2002 to varying degrees to sample fish, but are no longer used in the Sentinel Survey. Hand lines were used mostly in conjunction with nets or trawls as a means of determining presence of cod for tagging purposes or when nets were not catching fish. Petty Harbour used hand lines exclusively in the Sentinel Survey, and information from this survey was used mainly for biological sampling as catch rate information from hand lining is difficult to interpret.

Hook and line crews fished two tubs of baited linetrawl. Each tub consisted of approximately 500 hooks for a total of 1000 hooks per fishing day. Gillnet crews fished a maximum of six fifty fathom 5½ inch monofilament gillnets. Nets were rigged 2-3 to a fleet and up to three fleets were fished per fishing day. In addition, selected sites fished one 3¼ inch monofilament gillnet at least one day per week. All fish caught in gillnets and on hooks were landed and measured. If catches exceeded 500 kg per week, the numbers of nets in a fleet were cut back. However, some consideration was given to bottom topography and net performance when reducing the number of nets in a fleet. Similarly, the number of hooks per tub was reduced if landings exceeded 500 kg per week. Other measures were considered if fish are particularly abundant in an area and catches appear to be excessive even with the minimal amounts of gear possible.

Prior to the start of sampling in 1995, a fixed (control) location on the fishing grounds was established for each site and will remain fixed for the duration of the project. Each fishing day, up to half of the gear was set at the control site. The remainder of the gear (experimental) was set at one or two other locations on the fishing grounds at the discretion of the crew. The location of each fishing set was plotted on a nautical chart. The time of the set and the soak time for the gear were recorded. Other environmental observations were recorded, including wind direction and speed, percent cloud cover, tide conditions, presence of invertebrates (bait) and other fish species in the area, marine mammals, sea birds and any other variables which might have influenced fishing behavior. Selected sites were equipped with a CTD (measuring temperature and salinity at depth). At these locations, casts were conducted in the vicinity of fishing sets each fishing day. CTD locations were fished for subsequent years if possible.

When the gear was retrieved, catches from the control and experimental gear were kept separate and sampled on shore. All fish from gillnet, hand line and linetrawl, and a sample of the catch from traps, were measured for length and sex. Otoliths were sampled on a length-stratified basis and stored in manila envelopes with relevant information recorded on the outside. Every other week, selected sites collected a sample of up to 100 frozen fish. These were transported to St. John's for detailed biological sampling. All information was recorded on forms similar to those used by the Port Sampling Section and on DFO Research Vessels. Other biological samples were collected as needed.

RESULTS

Table 2 and Fig. 1 summarize Sentinel activity by gear type and NAFO Division from 1995 to 2007. Included in the table, and plotted in the figure, are the number of sets of gear in each division (Nhauls), the total number of fish caught (Nmeas) and the number of sets that had no fish in them (Nzero). Gillnet (5½") in 3K shows a noticeable decrease in number of fish caught despite having greater effort from 2000 to 2002. The number of sets of gillnet (both mesh sizes) has remained relatively stable in all Divisions with the exception of 3L gillnet (5½") which decreased in 2003 and has remained at about 800 sets (compared to about 1200 sets in earlier years). Linetrawl effort in both Div. 3K and 3L declined from 1995 to 1999 and in recent years is much lower at 40 or 50 sets than the 130-365 sets that were done in the first three years of the survey.

Fourty-three inshore fishing enterprises representing communities from Black Tickle to St. Mary's Bay participated in the 2J3KL Sentinel Survey for 2007 (44 in 2006). Survey activity covered mostly summer and fall periods in all years, traditional fishing times for the areas involved.

Figure 2-4 show the catches (in scaled symbols) from every set in 2007 of 3¼" gillnet, 5½" gillnet, and linetrawl. Control sites were generally consistent from year to year but shifts in location may have resulted due to weather or tide conditions or competition for sites by commercial activity.

Figure 5 shows overall average CPUE by division from 1995 to 2007 for the three main gear types used in sentinel activity. Div. 3L had the highest catch rates in gillnet over the time series. Gillnet (5½") catch rates in all divisions declined from 1998 to 2002 and then increased from 2002 to 2007. Small mesh gillnet catch rates are more stable over the time series and it is more difficult to determine trends, although a decreasing trend from 1996 to the early 2000s is apparent in 3K and 3L. The gear's ability to catch two distinct size ranges of fish could mask any trends in one or the other size group from year to year. When compared to Div. 3L, linetrawl catches were generally higher in 3K until 1998, and once again from 2003 to 2007. The 2005 value in 3K was the second highest observed. Catch rates in 2J were very low compared to 3K and 3L in all gears in all years. In 2005 however, catch rates in 5½" gillnets were much higher than previous years and those higher catch rates were maintained in 2006 and 2007.

Figure 6-8 give mean CPUE by community for gillnet and linetrawl organized from north to south. Catch rates in 5½" gillnet were very low in northern areas and were highest around the Bonavista and Little Catalina areas in most years (Fig. 6). In 2007, many locations had the highest catch rates in the time series, particularly in the more northern areas. Small mesh gillnet (Fig. 7) showed more variability in CPUE from year to year and between locations, with high catch rates in 2J and 3K in some years. Catch rates were most consistent from Wesleyville to Petley. Linetrawl was not as widely used in 2J3KL and catch rates were variable (figure 8).

Tables 3-7 compare the mean yearly catch rate to the overall mean catch rate for each participant from 1995-2007. Changes greater than 10% are highlighted. In 2007, 57% of participants had 5½" gillnet control sites that were similar to or 10% higher than the overall mean (66% for experimental sets). For small mesh gillnet, 48% of participants had similar or increased catch rates compared to the overall mean. Linetrawl showed higher than

mean catch rates (10% or higher difference) in 5/11 of locations when looking at control sites and 60% of the locations when considering experimental sets.

Length frequencies are given in Fig. 9-11 as proportion at length by gear type and NAFO division. The 5½" gillnet frequencies (Fig. 9) show the narrowest range of size selectivity (50-80 cm). Given the highly selective nature of this gear, frequencies are generally the same shape from year to year, although in Div. 3K, the 1997 frequency seems to show a shift toward larger fish. In Div. 2J, the early years of the survey caught little fish in the 5½" gillnet (Fig. 9, left panel) and results in a frequency that is less smooth in appearance. Interestingly, with fewer fish in the frequency, there seems to be a bimodal shape to the curve similar to that seen in the small mesh gillnet. When the catch of larger fish increased in recent years, the fish evident at smaller sizes is less noticeable.

Small mesh gillnet catches primarily smaller fish (in the 35-48 cm range) but also picks up a second mode of fish in the 50-65 cm range. Changes in size distribution are difficult to detect in this gear (similar to the 5½" gillnet) due to its limited selection pattern.

Linetrawl has the widest range of size selection (Fig. 11) among the gears used in the Sentinel survey mostly catching fish from about 30 cm to 70 cm. Changes in size distribution of fish can be detected in this gear more readily and in Div. 3K and 3L a shift toward larger fish is evident from 2002 to 2007.

Length frequencies, scaled by amount of gear used, are summarized in Fig. 12.

Figure 13-21 present weekly mean catch rates (number of fish per net of 1000 hooks) by year, NAFO Division and gear. Week 23 corresponds to June 1 in most years (week 22 in 2001-02, and 2006-07).Catch rates in some years are higher in late fall (weeks 44-49) in both mesh sizes of gillnet. Not all participants survey during this time of year (10 weeks are allocated to each participant based on traditional fishing times), but the areas that do fish during late fall generally have better catch rates. This may be the effect of fish moving into over-wintering areas during this time of year.

Table 1. Number of Sentinel sets (all gears) by community since 1995 and the weeks allocated for each year.

Comm	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Black Tickle		48	63	54	64	42	80	72	72	80	80	69	80
Williams Hr	54	48	58	50	39	49	60	45		49			
Tub Hr	22	25	28	24	39	80	80	80					
Triangle	24	25	29	29	62	70	80	76	78	80	80	80	80
Penny's Hr	46	50	51	62	64	81	81	56	80	80	71	80	80
Spear Hr	48	73	81	93	64	80	80	88	80	80	80	80	80
St. Lewis		72	83	48	60	80	80	79	80	80	80	80	80
Mary's Hr						76	80	80	80	79	80	72	80
Cape Charles	28	36	38	32	63								
Quirpon							76						
St. Lunaire	38	52	48	55	64	60	71	76	72	77	70	69	64
Great Brehat	56	73	68	76	30								
Goose Cove	60	56	68	72	54	60	60	68	80	80	80	74	60
Conche	40	48	48	48	60	60	60	60	61	60	60	60	60
Englee	40	46	48	57	55	67	70	70	70	70	70	57	77
Hr Deep	36	45	45	49	54	59	65	68	70	70	58	59	59
Jackson's Arm	50	59	57	84	53								
Sopp's Arm						50	60	70	70	67	69	70	46
Westport						58	69	70					
Coachman's Cove	46	58	51	52	63	70	70	70	70	70	75	63	70
Ming's Bight	56	46	46	47	44	57	54	60	49	52	52	54	52
La Scie	36	48	50	49	38	70	67	65	58	61	61	61	61
Shoe Cove	60	54	51	53	52	60	62	60	54	54	54	54	54
Smith's Hr	60	64	62	72	48	58	60	60	60	54	60	60	58
Jackson's Cove	56	48	48	48	32	42	38	40					
Miles Cove	56	76	83	83	56	55	68	59	64	70	70	69	84
Glover's Hr						54	69	68	69	70	69	63	69
Summerford	60	78	84	81	91	72	71	70	82	90	84	77	77
Durrell	56	60	39	38	36	57	55	58					
Too Good Arm	39	48	53	54	48	77	70	68	70	70	70	62	70
Deep Bay	44	41	45	49	49								
Fogo					64	72	108	113	71	70	70	60	60
Joe Batt's Arm	48	32	40	41	80	77	71	87					
Tilting	53	49	45	39	82	78	69	83	65	72	67	64	64
Seldom	38	41	31	45	69	72	76	74	59	60	58	60	59
Aspen Cove	39	42	45	32	47	59	60	55	47	61	59	60	59
Lumsden	74	72	74	63	54	56	54	52	53	53	50	46	46
Wesleyville	64	68	91	78	62	68	67	68	68	67	68		
Newtown												64	
Greenspond													34
Centreville	40	30	32	32	20	36	40	40					
St. Chad's	60	60	62	58									
Happy Adventure					59	56	71	72	70	66	70	70	70
Plate Cove West	39	46	52	56	48	68	70	70	70	66	70	62	70
Bonavista	1	41	29	20	30	27	33	38					
Little Catalina	60	59	67	74	36	59	44	60	60	57	60	54	60
Petley	40	52	56	46	59	80	72	68	63	67	70	70	70
Thornlea	60	72	72	66	48	77	84	60					
Hopeall	40	32	32	32	32	40	50	50	50	49	50	50	50
Heart's Content	57	16	40	66	48	74	60	60	60	60	59	54	50
Bay de Verde		32	49	31	46	68	69	69	69	70	68	57	69
Ochre Pit Cove	40	51	48	48	48	60	60	60					
Carbonear	54	75	73	71	46	60	60	60	56	56	56	58	56
Port de Grave	40		48	48	48	60	60	60					
Foxtrap	74	62	64	65	41	46	52	52	48	48	47	48	48
Pouch Cove	39	32	43	51	53	56	70	69	70	70	70	70	70
Petty Hr					47	57	45	32					
Bay Bulls	121	94	102	108	70	48	46	45	31	60	57	54	61
Calvert	60	45	45	52	46	64	60	60	56	60	60	60	60
Ferryland	59	44	42	39	40	51	65	68					
Aquaforte	60	47	48	47	32	48	40	40					
Renews	33	37	29	28	32	48	60	60	70	54	62	70	70
St. Shott's	34	40	49	51	30	47	40	40	36	32	40	40	
Riverhead	118	114	94	88	69	66	91	84	40	42	40	22	48
Admiral's Beach	61	52	68	72	47	57	59	60	60	53	58	60	60
Point Lance	58	49	48	48	6	24	36	40	36	40	40	40	40
Number of weeks	**15**	**12**	**12**	**8**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Number of enterprises	**53**	**55**	**56**	**56**	**58**	**58**	**59**	**58**	**44**	**45**	**44**	**44**	**43**

* two enterprises

Table 2. Set details for Sentinel activity by NAFO division and gear type, 1995-2007. (Nhauls=number of sets, Nzero=number of sets with no fish, Nmeas=number of fish measured).

Gillnet 5 1/2"

	Division	Data							
	2J			3K			3L		
Year	Sum of Nhauls	Sum of Nzero	Sum of Nmeas	Sum of Nhauls	Sum of Nzero	Sum of Nmeas	Sum of Nhauls	Sum of Nzero	Sum of Nmeas
1995	218	160	118	663	150	9160	896	49	19521
1996	333	295	87	886	72	33117	946	30	60891
1997	319	233	544	839	55	23747	1048	18	60897
1998	294	198	464	994	76	36991	1118	33	86892
1999	341	228	456	1112	87	25422	1000	29	57726
2000	438	300	280	1353	253	16146	1316	107	43324
2001	445	363	180	1400	351	7670	1255	172	25217
2002	433	318	698	1351	408	5345	1267	189	24624
2003	350	240	446	1063	136	7209	801	42	24395
2004	395	236	615	1102	124	14958	842	34	31808
2005	354	125	1928	1085	92	25481	845	54	35027
2006	345	110	2087	1068	71	28316	825	66	32538
2007	360	150	1899	1068	77	36415	810	124	36760

Gillnet 3 1/4"

	Division	Data							
	2J			3K			3L		
Year	Sum of Nhauls	Sum of Nzero	Sum of Nmeas	Sum of Nhauls	Sum of Nzero	Sum of Nmeas	Sum of Nhauls	Sum of Nzero	Sum of Nmeas
1995									
1996	3	0	14	15	0	1822	9	0	500
1997	49	6	2131	42	2	2299	84	7	4248
1998	89	12	2265	109	6	3917	125	4	5815
1999	109	27	854	92	6	2762	95	7	2793
2000	119	17	1707	81	11	2165	140	8	4843
2001	150	41	1309	135	20	2880	132	13	3931
2002	143	41	2975	132	25	2966	143	16	3857
2003	118	30	1407	133	9	5654	147	10	6567
2004	131	20	1911	147	7	3880	126	7	4883
2005	117	18	2083	125	6	5220	133	15	6269
2006	115	16	3240	98	6	3930	134	16	3870
2007	120	31	2445	94	16	3582	127	26	4400

Linetrawl

	Division	Data							
	2J			3K			3L		
Year	Sum of Nhauls	Sum of Nzero	Sum of Nmeas	Sum of Nhauls	Sum of Nzero	Sum of Nmeas	Sum of Nhauls	Sum of Nzero	Sum of Nmeas
1995				465	34	22681	365	48	13662
1996	20	5	75	296	16	13305	201	22	9153
1997	22	15	19	262	6	23066	149	0	9938
1998	8	1	26	184	9	7017	129	13	5307
1999	3	3	0	116	3	3094	47	3	2072
2000				91	24	967	52	6	2272
2001	22	12	59	112	10	2135	106	15	3331
2002				115	8	2126	62	1	1888
2003				84	2	3621	59	8	1708
2004				79	5	3310	47	7	2107
2005				83	1	4242	53	6	2432
2006				75	2	3001	36	4	952
2007				85	6	4312	46	5	1507

Table 3. Relative CPUE trend for 3¼" gillnet (calculated as annual CPUE divided by mean CPUE for each location).

	Gillnet 3 1/4 in. Experimental												
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Black Tickle				3.104							1.061	2.740	
Williams Hr			1.440					1.873		1.111			
Tub Hr			1.536	3.034		1.079							
Triangle			4.284	1.861				1.337					
Penny's Hr				1.689						1.294		1.375	3.049
Spear Hr			3.097			1.004		1.664		1.250		1.092	
St. Lewis			1.158			1.038			0.984			2.426	1.716
Mary's Hr											2.015	1.094	1.337
Cape Charles			1.302	1.221									
Quirpon							1.000						
St. Lunaire									1.430		2.326	2.600	1.451
Great Brehat				1.000									
Goose Cove									1.017	0.906	1.168	1.190	
Englee					2.203	1.529			1.373			1.075	
Hr Deep					1.031			1.782	1.513				
Jackson's Arm			1.706										
Sopp's Arm								1.427			1.460	1.169	
Westport							1.006	0.994					
Coachman's Cove			2.057	1.204		0.948	0.978		1.330	1.194			
La Scie							1.122		3.916	1.222	1.113	1.080	
Miles Cove		2.835	1.764						1.438				1.120
Glover's Hr							1.172	1.162	0.926		0.997		1.469
Summerford		2.258		1.238	1.281			1.027	1.412	0.930			1.070
Too Good Arm			1.252	1.227	0.997	0.941			1.044		1.509	1.194	1.017
Deep Bay				1.121									
Fogo								1.486			1.334		
Joe Batt's Arm				1.819	0.902	1.009							
Tilting							0.914	1.031			1.276	2.079	1.457
Seldom				1.000									
Wesleyville			1.078		1.031	1.121			0.953	1.135	1.736		
Newtown												1.000	
Happy Adventure						1.447	1.256	1.003	1.277			0.919	0.995
Plate Cove West			1.132	1.470			1.017		1.547	1.158	1.341		
Little Catalina			1.504	1.515					1.240	0.920	1.499		1.209
Petley		1.521	1.150	1.349	1.048	0.988		1.545	0.996	0.936			
Hopeall									1.064		0.901	1.112	1.817
Heart's Content									2.023	2.059	2.448	1.587	1.051
Bay de Verde			2.173	2.131					1.404	0.992			
Foxtrap		1.302	1.164	1.095	1.070				1.717		1.283		
Pouch Cove				1.315	1.513	1.383	0.910		0.913		1.254		
Bay Bulls			3.718	1.948									1.191
Ferryland		1.657	2.129			0.975	1.145						
Renews												2.462	
St. Shott's			1.592										
Admiral's Beach		1.412	2.269	1.725	1.053	1.480	1.144		1.087				

2J+3Kad
Northern Inshore (3Khi+3Lab)
Southern Inshore (3Lfjq)

no survey
> 10%
within 10%
<10%

Table 3. Relative CPUE trend for 3½" gillnet (calculated as annual CPUE divided by mean CPUE for each location).

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Black Tickle			0.169	1.104	0.169		0.230	0.236	0.330	0.620		2.744	0.640
Williams Hr			1.441	0.821	0.513	0.615	0.639	1.874		1.111			
Tuh Hr		0.261	1.566	1.034	0.474		0.163	0.433					
Triangle		0.349	4.284	1.661	0.246	0.566	0.837	1.037	0.451	0.398	0.315	0.592	0.257
Penny's Hr		0.596	0.727	1.694	0.360	0.471	0.598	0.621	0.473	1.204	0.748	1.375	4.043
Spear Hr		0.264	1.507	0.810	0.071		0.156	1.643	0.590	1.250	0.620		0.767
St. Lewis			1.442	0.667	0.262		0.452	0.772		0.676	0.858	2.426	1.276
Mary's Hr							0.351	0.633	0.509	0.521	2.016	1.694	1.385
Cape Charles			1.360	1.221	0.477								
Gurpon													
St. Lunaire		0.294	0.401	0.718	0.017		0.466	0.404	1.436	0.894	1.725	2.809	1.551
Great Brehat													
Goose Cove								0.887			1.166	1.116	0.851
Englee				0.404	2.764	1.529	0.553	0.684	1.274	0.742	0.694		0.487
Hr Deep			0.757	0.842		0.894	0.711	1.792	1.511	0.500			
Jacksom's Arm			1.581	0.716	0.678								
Joppi's Arm								1.107	0.858	0.596	1.466	1.169	0.912
Westport													
[illegible]			1.201	1.251	0.864			0.201	0.330	1.194	0.037	0.796	0.783
La Scie			0.136	0.469	0.311	0.711	1.117	0.035	1.416	1.102	1.113		0.866
[illegible]		0.855	1.084	0.741	0.565	0.476	0.443	0.673	1.436	0.390	0.868	0.697	1.120
[illegible]							1.174	1.162		0.523		0.751	1.460
[illegible]		1.109	0.534	1.249	1.291	0.311	0.744		1.111		0.693	0.472	
[illegible]			1.267	1.237			0.903	0.431		0.854	1.500	1.194	
[illegible]				1.121	0.879								
[illegible]								1.146	0.443	0.737	1.104		
[illegible]				1.910			0.526	0.744					
[illegible]				0.875	0.540	0.586			0.542	0.696	1.276	2.009	1.387
[illegible]													
[illegible]				0.826		1.191	0.702	0.618		1.145	1.736		
[illegible]													
[illegible]						1.447	1.256		1.277	0.539	0.564		
[illegible]			1.111	1.1	0.439	0.659		0.869	1.647	1.155	1.131	0.763	0.604
[illegible]					0.565	0.637	0.607	0.427	1.536		1.135	0.789	1.208
[illegible]		1.304	1.179	1.131			0.547	1.141			0.023	0.321	0.677
[illegible]							0.666	0.875		0.545		1.11	1.647
[illegible]			0.690	0.554	0.364	0.328	0.726	0.279	2.024	1.059	2.441	1.580	
Bay de Verde			1.211	2.131	0.816	0.425	0.186	0.713	1.404		0.740	0.701	0.719
Fogo Isl		1.304	1.114			0.785	0.706	0.705	1.717	0.679	1.241	0.732	0.700
Fourth Cove			0.766	1.379	1.014	1.840		0.738		0.743	1.218	0.700	0.705
Big Bulls			1.215	1.164	0.257		0.175	0.004	0.205		0.411		1.541
FerryLand		1.304	2.109	0.214	0.713		1.141	0.167					
Renews									0.671		0.420	1.341	0.444
St. Shott's			1.214			0.408							
Admiral's Beach		1.31	2.000	1.570		1.140	1.144	0.670		0.661	0.307	0.093	0.160

Table 4. Relative CPUE trend for 5½" control gillnet (calculated as annual CPUE divided by mean CPUE for each location)

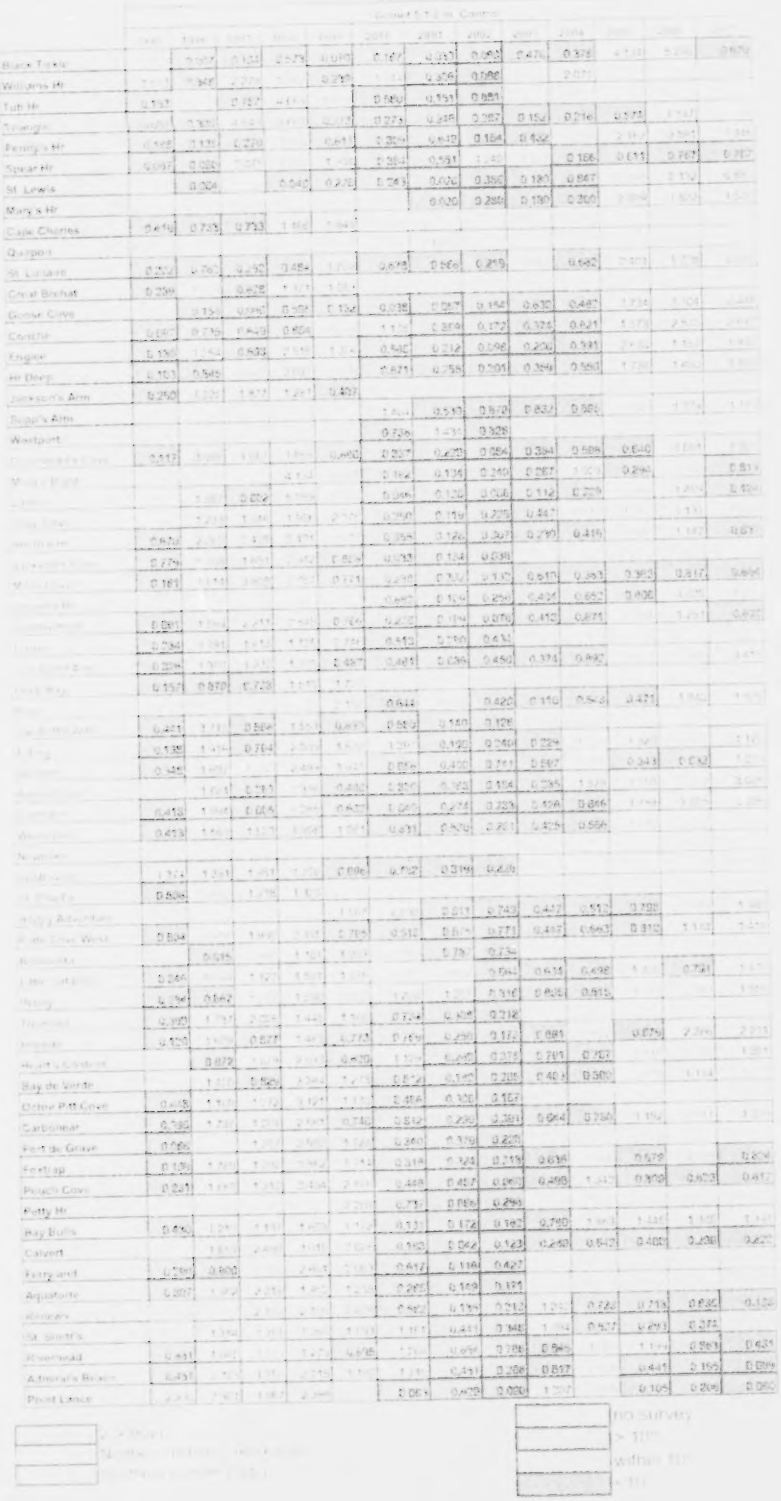


Table 5. Relative CPUE trend for 5" experimental gillnet (calculated as annual CPUE divided by mean CPUE for each location)

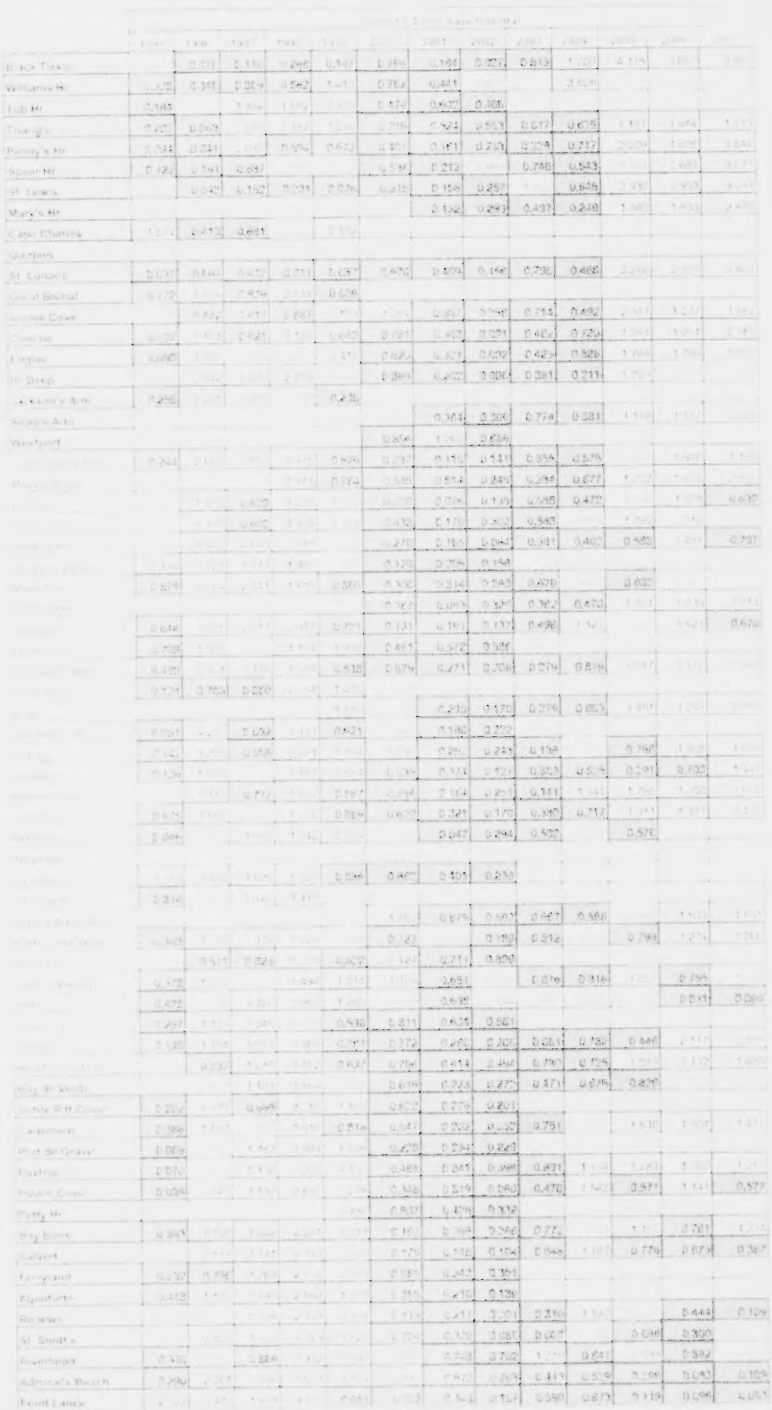


Table 4. Relative CPUE trend for 5½" control gillnet (calculated as annual CPUE divided by mean CPUE for each location).

	Gillnet 5 1/2 in. Control												
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Black Tickle											4.134	3.296	
Williams Hr	1.593		2.279	1.062		1.014				2.071			
Tub Hr				4.668	1.009								
Triangle			4.843	3.668								1.147	
Penny's Hr				1.081						0.973	2.162	3.881	
Spear Hr			2.075	1.022	1.304			4.240	1.007				
St. Lewis											0.976	2.132	
Mary's Hr													
Cape Charles				1.466	1.649								
Quirpon							1.000						
St. Lunaire					1.209				0.961				
Great Brehat		1.009		1.371	1.553								
Goose Cove											3.734	3.304	2.444
Conche					1.054	1.138					1.573	2.535	2.847
Englee		1.254		2.519	1.304						2.635	1.157	1.836
Hr Deep			0.947	3.037	0.999						1.736	1.490	
Jackson's Arm		1.226	1.837	1.281									
Sopp's Arm						1.404					0.929	1.779	
Westport							1.434						
Coachman's Cove		3.099	1.857	1.955								1.891	1.323
Ming's Bight				4.134	0.961					1.923		1.042	
La Scie		1.587		5.269	1.096						0.946	1.499	
Shoe Cove		1.233	1.548	1.968	2.075					0.912	1.007	1.131	1.089
Smith's Hr		2.282	2.429	2.491	0.977						0.937	1.142	
Jackson's Cove		1.368	1.851	2.942									
Miles Cove		1.914	3.808	2.757									
Glover's Hr												4.029	1.056
Summerford		1.589	2.211	2.846							0.964	1.251	
Durrell		1.191	1.418	1.125	2.746								
Too Good Arm		1.300	1.232	1.375							1.050		
Deep Bay				1.510	1.729								
Fogo					2.192		1.008					1.940	
Joe Batt's Arm		3.710		1.653									
Tilting		1.919		2.005	1.678	1.397				1.003	1.320		
Seldom		1.697	1.072	2.499	1.644					1.090			1.279
Aspen Cove		1.884		1.356						1.578	1.250	0.967	3.085
Lumsden		1.994		1.285							1.468	1.509	3.088
Wesleyville		1.563	1.523	1.896	1.961						1.049		
Newtown												1.000	
Centreville	1.374	1.381	1.951	1.270									
St. Chad's		0.932	1.238	1.323									
Happy Adventure					1.567	2.098						0.919	1.389
Plate Cove West		0.916	1.990	2.466								1.143	1.414
Bonavista			0.955	1.781	1.263	0.985							
Little Catalina		1.044	1.122	1.501	1.876	1.037	0.987				1.328		1.479
Petley			1.057	1.500	0.977	1.206	1.257				1.037	0.929	1.899
Thornlea		1.737	2.006	1.448	1.155								
Hopeall		1.629		1.465						0.972		2.396	2.211
Heart's Content			1.579	2.033		1.129					0.935	1.037	1.391
Bay de Verde		1.420		3.384	1.273						0.972	1.114	1.056
Ochre Pitt Cove		1.100	1.272	3.121	1.133								
Carbonear		1.737	1.201	2.581							1.192	0.911	1.329
Port de Grave			1.257	2.990	1.728								
Foxtrap		1.769	1.392	2.862	1.714					0.967		1.089	
Pouch Cove		1.865	1.212	2.464	2.178					1.342			
Petty Hr					2.280								
Bay Bulls		1.210	1.197	1.683	1.172					1.389	1.448	1.308	1.394
Calvert		1.650	2.468	3.016	2.628								
Ferryland			0.982	2.604	2.063								
Aquaforte		1.662	2.218	1.952	1.256								
Renews			2.100	2.190	2.074				1.242				
St. Shott's		1.744	1.351	1.365	1.593	1.161			1.784				
Riverhead		1.645	1.013	1.275		1.268				1.063	1.199		
Admiral's Beach		2.773	1.760	2.215	1.188	1.740				0.954			
Point Lance	2.236	2.921	1.967	2.388					1.207	0.929			

2J+3Kad
Northern Inshore (3Khi+3Lab)
Southern Inshore (3Lfjq)

no survey
> 10%
within 10%
<10%

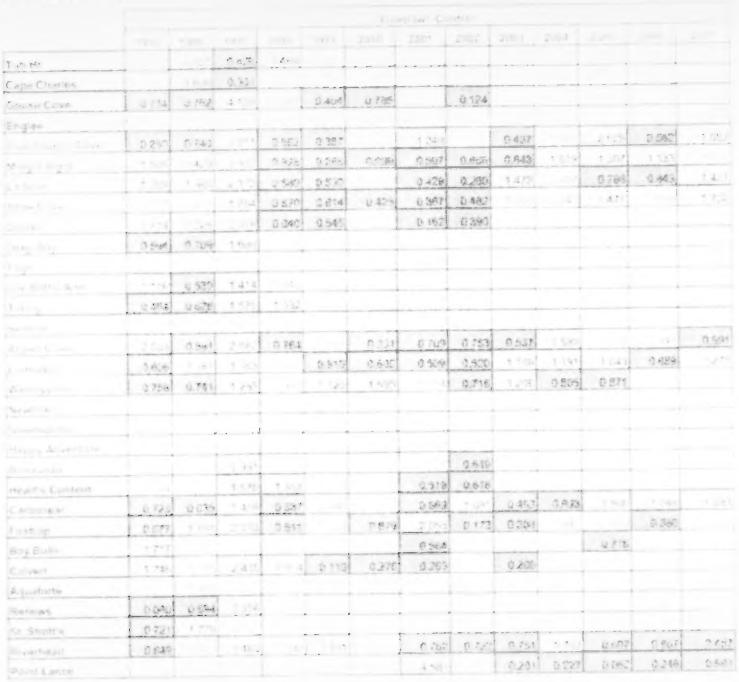
Table 5. Relative CPUE trend for 5½" experimental gillnet (calculated as annual CPUE divided by mean CPUE for each location).

	Gillnet 5 1/2 in. Experimental												
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Black Tickle										1.700	4.115	1.657	2.367
Williams Hr					1.413			0.905		3.889			
Tub Hr			1.354	1.692	3.309								
Triangle			2.914	2.152	1.240						1.171	1.944	1.273
Penny's Hr			2.060								2.009	1.808	3.844
Spear Hr				0.918	1.092			0.956			1.034	2.487	3.077
St. Lewis									1.002		2.936	2.963	3.093
Mary's Hr											1.360	1.633	2.938
Cape Charles	1.574				2.132								
Quirpon							1.000						
St. Lunaire											3.280	2.520	2.453
Great Brehat		1.224	1.869	2.138									
Goose Cove			0.417		2.723	1.264					2.317	1.237	1.482
Conche		1.101		1.120							1.997	1.951	2.788
Englee		1.290	0.987	0.962	2.416						1.788	1.790	1.889
Hr Deep	1.082	2.042	1.508	2.939	1.087						1.223	0.917	0.948
Jackson's Arm		2.234	1.329	0.948									
Sopp's Arm						0.939					1.146	1.157	2.829
Westport							1.260						
Coachman's Cove		2.685	1.797	1.875							1.069	1.998	1.189
Ming's Bight				1.341							1.202	1.826	2.557
La Scie		1.357		4.228	1.062						1.096	1.528	
Shoe Cove		1.381		1.588	1.102					0.984	1.785	2.018	1.044
Smith's Hr	0.966	1.676	2.669	2.515	1.019							1.484	
Jackson's Cove	1.114	1.723	1.773	1.985	0.915								
Miles Cove		2.224	2.141	1.811									
Glover's Hr											1.364	1.999	3.014
Summerford		1.625	2.014	2.418						1.323	0.949	1.423	
Durrell		1.520	1.033	1.101	1.998								
Too Good Arm		2.474	1.116	1.758							1.217	1.172	2.009
Deep Bay				2.034	1.439								
Fogo					1.574	0.999					1.491	1.236	2.266
Joe Batt's Arm		4.282		1.177									
Tilting		1.372		2.041	1.694	1.730						1.356	1.604
Seldom		1.575	0.908	4.187	1.564								1.497
Aspen Cove		1.116		1.677						1.341	1.755	1.290	2.628
Lumsden		1.561	0.948	1.296							1.311	1.391	3.125
Wesleyville		1.033	1.555	1.742	2.074	1.059				0.971			
Newtown												1.000	
Centreville	1.272	1.622	1.879	1.322									
St. Chad's		1.064	1.148	1.475									
Happy Adventure					1.087	1.252					0.943	1.833	1.891
Plate Cove West		1.258	1.376	1.726	0.921		0.989			1.885		1.274	1.266
Bonavista				1.309		2.124							
Little Catalina		1.253	0.924	1.494	1.714	1.106		1.075			1.307		1.264
Petley		1.029	1.320	1.862	1.208	0.959		0.944	0.962	1.096	0.927		
Thornlea		1.731	2.345	1.061									
Hopeall		1.194	1.231	1.866								2.117	2.395
Heart's Content			1.640	1.462							1.549	1.132	1.588
Bay de Verde		1.062	1.101	1.864	0.964								
Ochre Pit Cove		1.477		3.249	1.105								
Carbonear		1.504	0.936	1.916						0.977	1.636	1.504	1.471
Port de Grave			1.783	2.934	1.526								
Foxtrap			1.198	2.212	1.470					1.134	1.281	1.382	1.211
Pouch Cove		1.240	1.197	2.891	2.536					1.842		1.141	
Petty Hr					2.434								
Bay Bulls		1.788	1.649	2.291	1.341					0.924	1.162		1.234
Calvert		1.411	1.141	2.720	2.654					1.187			
Ferryland			1.252	2.054	2.565								
Aquaforte		1.101	2.430	2.063	1.283								
Renews			2.636	2.349	2.163					1.137	1.027		
St. Shott's		2.568	1.322	1.729	1.726					1.052			
Riverhead				1.312	1.349								
Admiral's Beach		2.281	2.004	2.077	1.964								
Point Lance	2.033	3.472	1.978	3.412									

2J+3Kad
Northern Inshore (3Khi+3Lab)
Southern Inshore (3Lfjq)

no survey
> 10%
within 10%
<10%

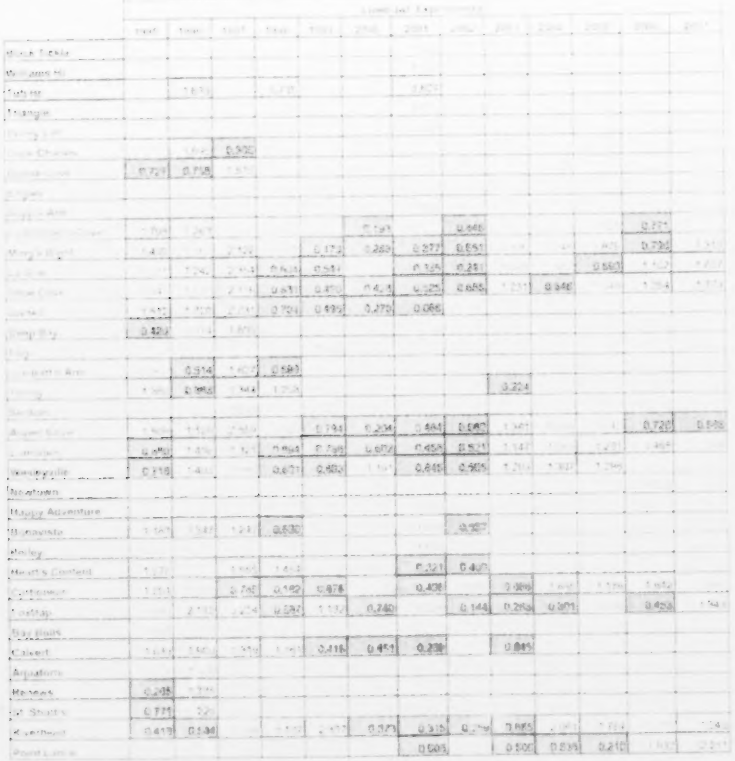
Table 6. Relative CPUE trend for control (inetrawl (calculated as annual CPUE divided by mean CPUE for each location).



Tuk Hi			0.67	1.40									
Cape Charles			0.32										
Source Cove	0.716	0.762	1.1		0.406	0.735		0.124					
Engle													
[illegible]	0.230	0.743	[illegible]	0.562	0.387	[illegible]	[illegible]	[illegible]	0.437	[illegible]	[illegible]	0.085	[illegible]
Mag's Right	[illegible]	[illegible]	[illegible]	0.925	0.245	0.036	0.567	0.465	0.643	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	0.540	0.547		0.428	0.280	1.475	[illegible]	0.795	0.443	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	0.870	0.814	0.474	0.907	0.482	[illegible]	[illegible]	1.47	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	0.340	0.545		0.163	0.390	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Jolly Roy	0.596	0.709	1.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	0.530	1.41	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	0.918	0.678	1.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	0.941	[illegible]	0.761	[illegible]	0.121	0.749	0.753	0.637	[illegible]	[illegible]	[illegible]	0.591
[illegible]	0.626	[illegible]	[illegible]	[illegible]	0.913	0.635	0.509	0.500	[illegible]	[illegible]	[illegible]	0.429	[illegible]
[illegible]	0.759	0.781	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.716	[illegible]	0.805	0.871	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.611	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Heath's Content	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.318	0.616	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cuttyhunk	0.724	0.634	[illegible]	0.937	[illegible]	[illegible]	0.562	[illegible]	0.457	0.423	[illegible]	[illegible]	[illegible]
Eastop	0.677	[illegible]	[illegible]	0.911	[illegible]	0.874	[illegible]	0.173	0.284	[illegible]	[illegible]	0.386	[illegible]
Bay Bulls	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.564	[illegible]	[illegible]	[illegible]	0.715	[illegible]	[illegible]
Calvert	1.79	[illegible]	2.41	[illegible]	0.110	0.270	0.263	[illegible]	0.200	[illegible]	[illegible]	[illegible]	[illegible]
Aquaforte	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Reneses	0.643	0.654	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ile Shotts	0.721	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Riverhead	0.849	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.760	0.705	0.751	[illegible]	0.607	0.807	0.467
Point Lance	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.291	0.027	0.062	0.248	0.641

no survey
> 10%
within 10%
< 10%

Table 7. Relative CPUE trend for experimental inetrawl (calculated as annual CPUE divided by mean CPUE for each location).



Rock Creek	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Williams Hi	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Tuk Hi	[illegible]	1.63	[illegible]	[illegible]	[illegible]	[illegible]	1.40	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Triangle	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cape Charles	[illegible]	1.42	0.525	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Source Cove	0.721	0.718	1.51	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Engle	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.193	[illegible]	0.445	[illegible]	[illegible]	0.771	[illegible]
Mag's Right	1.40	[illegible]	2.72	[illegible]	0.173	0.269	0.277	0.651	[illegible]	[illegible]	1.47	0.735	1.11
[illegible]	[illegible]	1.24	[illegible]	0.643	0.581	[illegible]	0.195	0.251	[illegible]	[illegible]	0.560	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	0.631	0.47	0.413	0.125	0.685	1.21	0.348	[illegible]	1.24	[illegible]
[illegible]	1.40	1.10	2.41	0.724	0.993	0.276	0.066	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Jolly Roy	0.826	[illegible]	1.67	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	0.514	1.40	0.597	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	1.46	0.996	1.44	1.05	[illegible]	[illegible]	[illegible]	[illegible]	0.224	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.733	0.234	0.843	0.647	1.47	[illegible]	1	0.720	0.556
[illegible]	0.48	1.85	1.14	0.944	0.798	0.672	0.458	0.531	1.14	[illegible]	1.43	1.46	[illegible]
[illegible]	0.218	1.40	[illegible]	0.631	0.482	1.14	0.845	0.905	1.20	1.32	1.24	[illegible]	[illegible]
Tuckerton	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Happy Adventure	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Brunswick	1.16	1.56	1.21	0.630	[illegible]	[illegible]	[illegible]	0.367	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hailey	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Heath's Content	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.121	0.420	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cuttyhunk	1.03	[illegible]	0.76	0.182	0.878	[illegible]	0.408	[illegible]	0.369	1.42	1.29	1.42	[illegible]
Eastop	[illegible]	2.10	1.24	0.930	1.13	0.740	[illegible]	0.144	0.254	0.901	[illegible]	0.459	1.44
Bay Bulls	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Calvert	1.14	1.56	1.10	1.13	0.418	0.451	0.238	[illegible]	0.845	[illegible]	[illegible]	[illegible]	[illegible]
Aquaforte	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Reneses	0.295	0.330	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ile Shotts	0.775	0.20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Riverhead	0.417	0.540	[illegible]	1.13	1.47	0.973	0.315	0.279	0.885	1.20	1.24	[illegible]	1.24
Point Lance	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.505	[illegible]	0.500	0.835	0.210	1.43	0.211

Table 6. Relative CPUE trend for control linetrawl (calculated as annual CPUE divided by mean CPUE for each location).

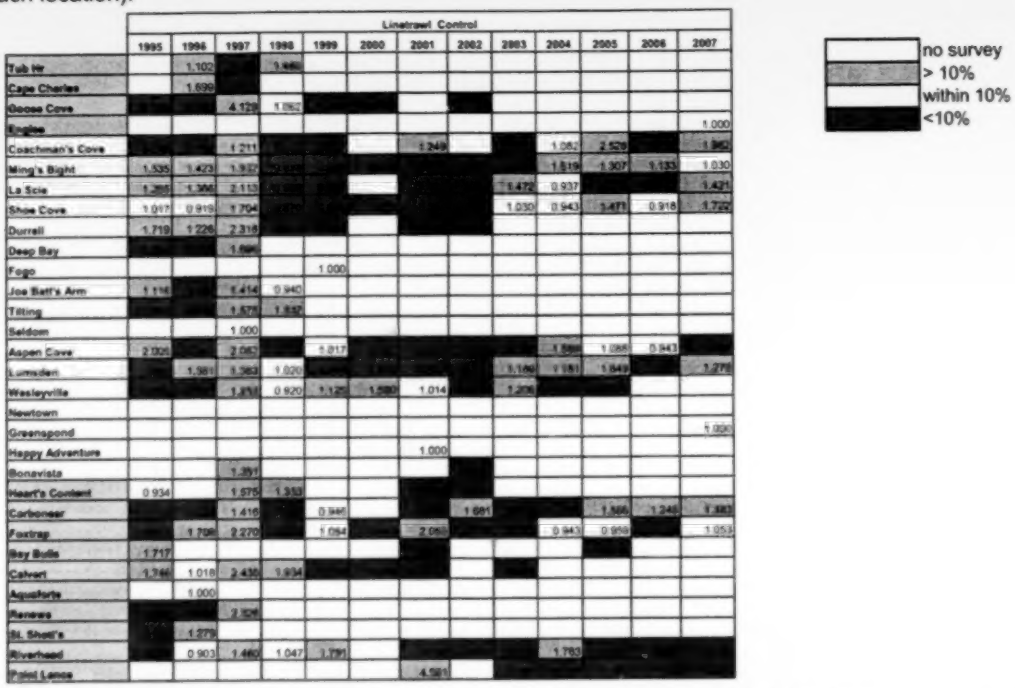
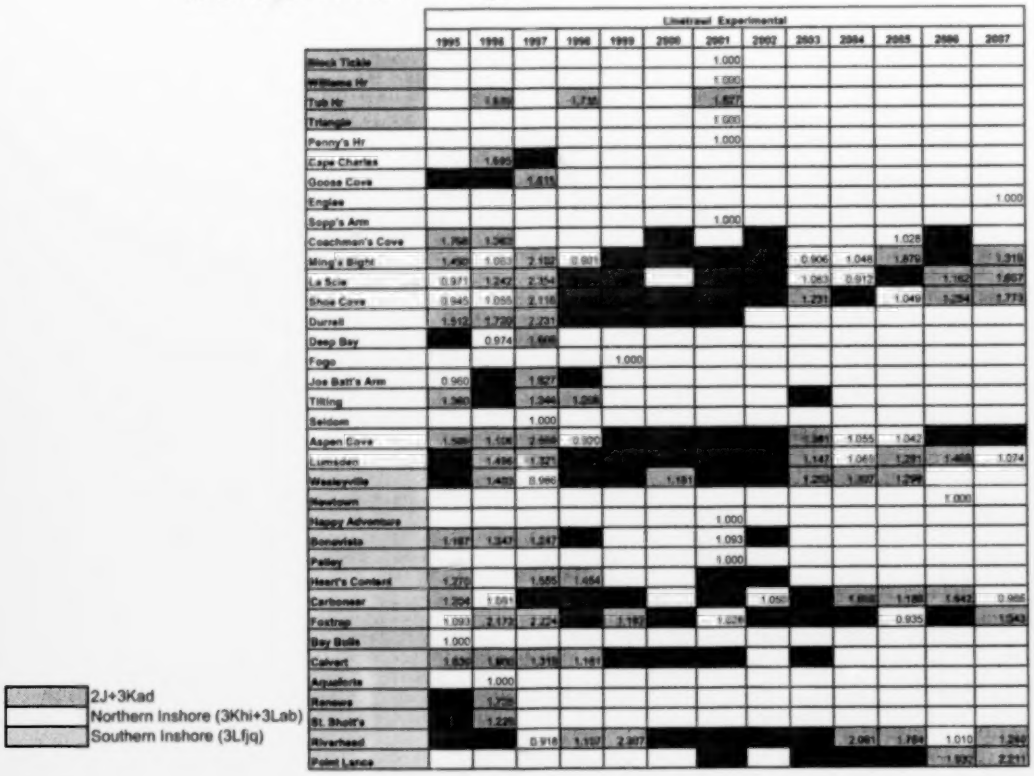


Table 7. Relative CPUE trend for experimental linetrawl (calculated as annual CPUE divided by mean CPUE for each location).



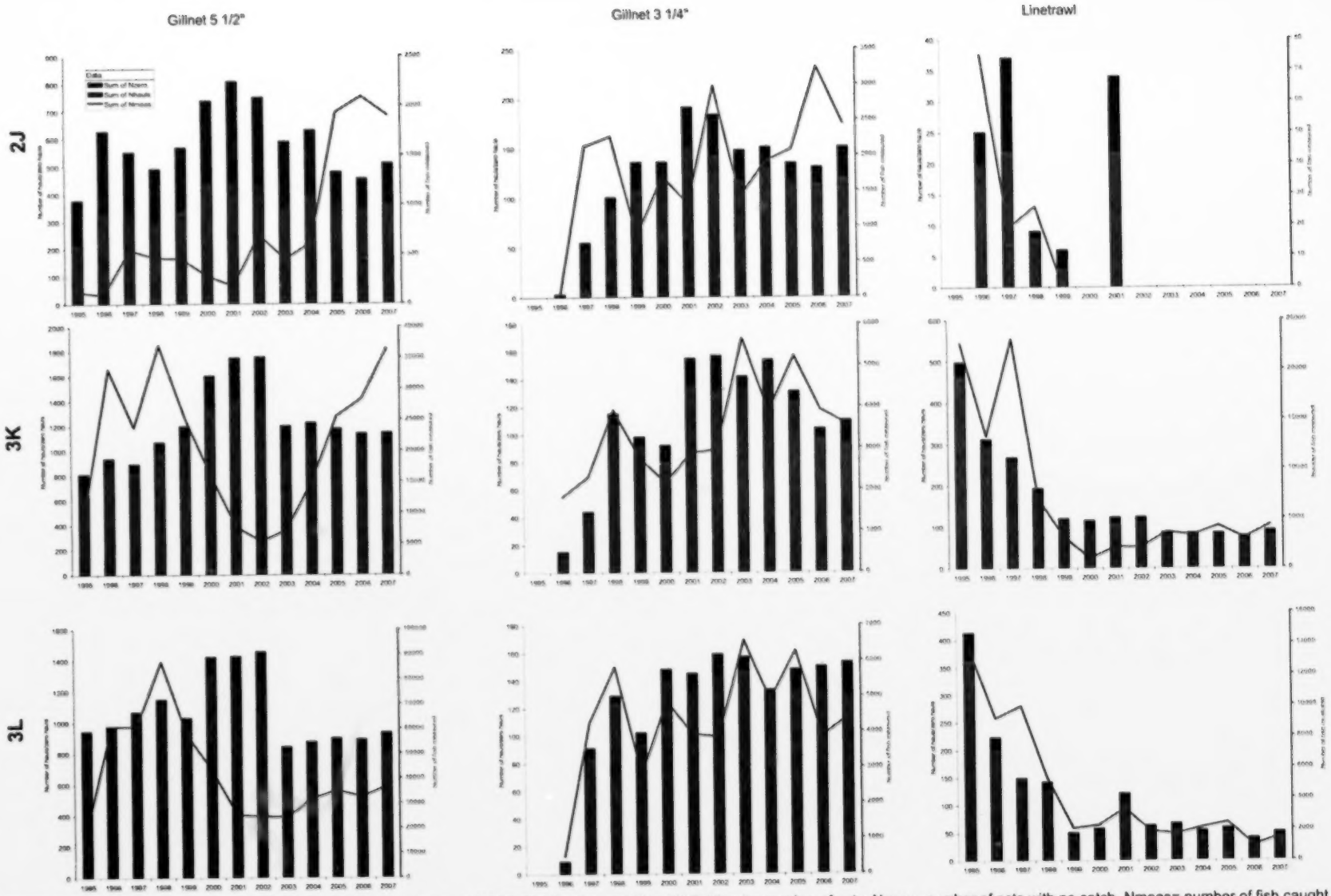


Figure 1. Summary plots of set and catch information by gear type and NAFO Division from 1995 to 2007. Nhauls= number of sets, Nzero= number of sets with no catch, Nmeas= number of fish caught.

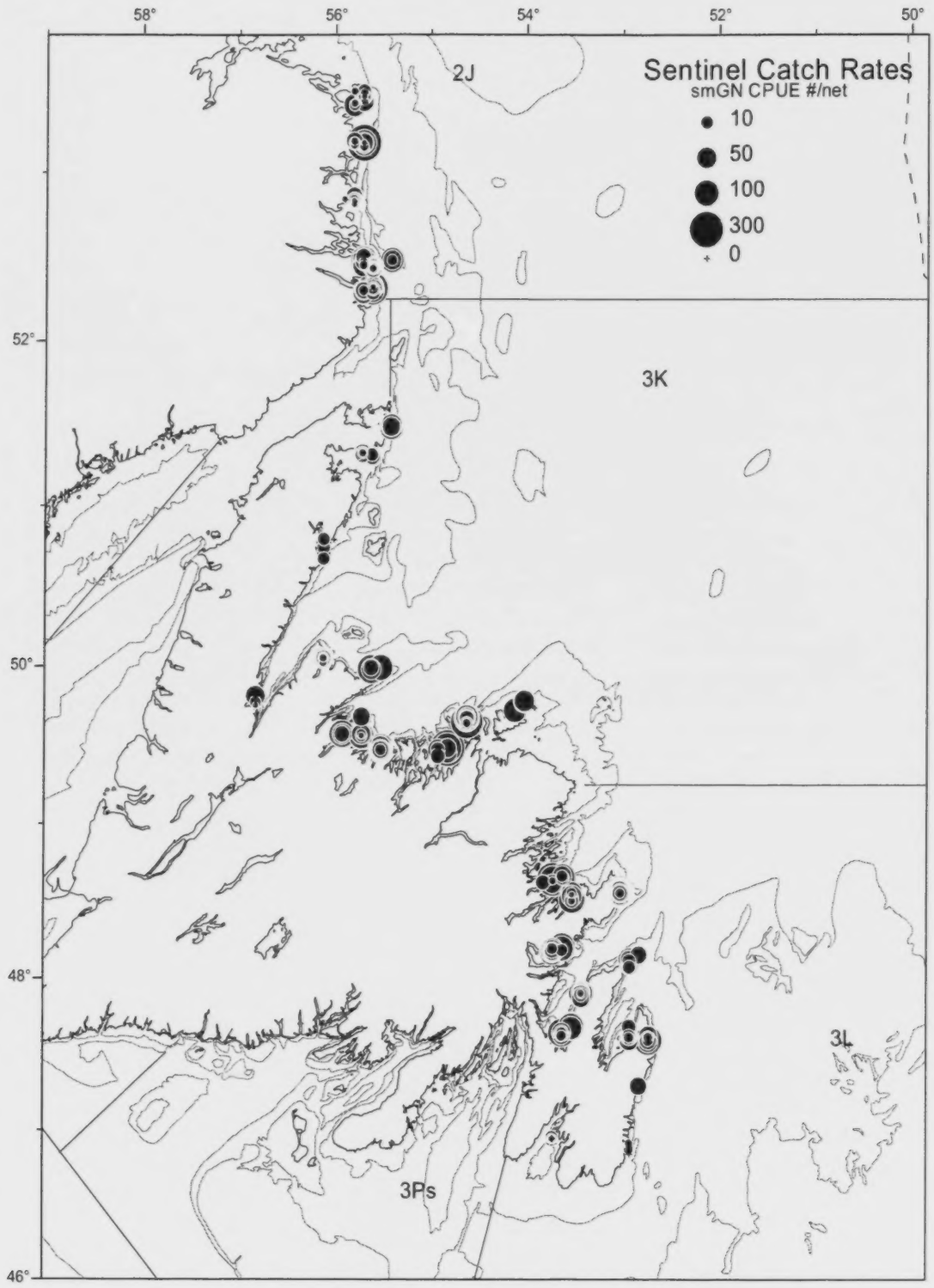


Figure 2. Sentinel survey in 2007 catch per unit effort (number of fish pr net) for 3¼" gillnet.

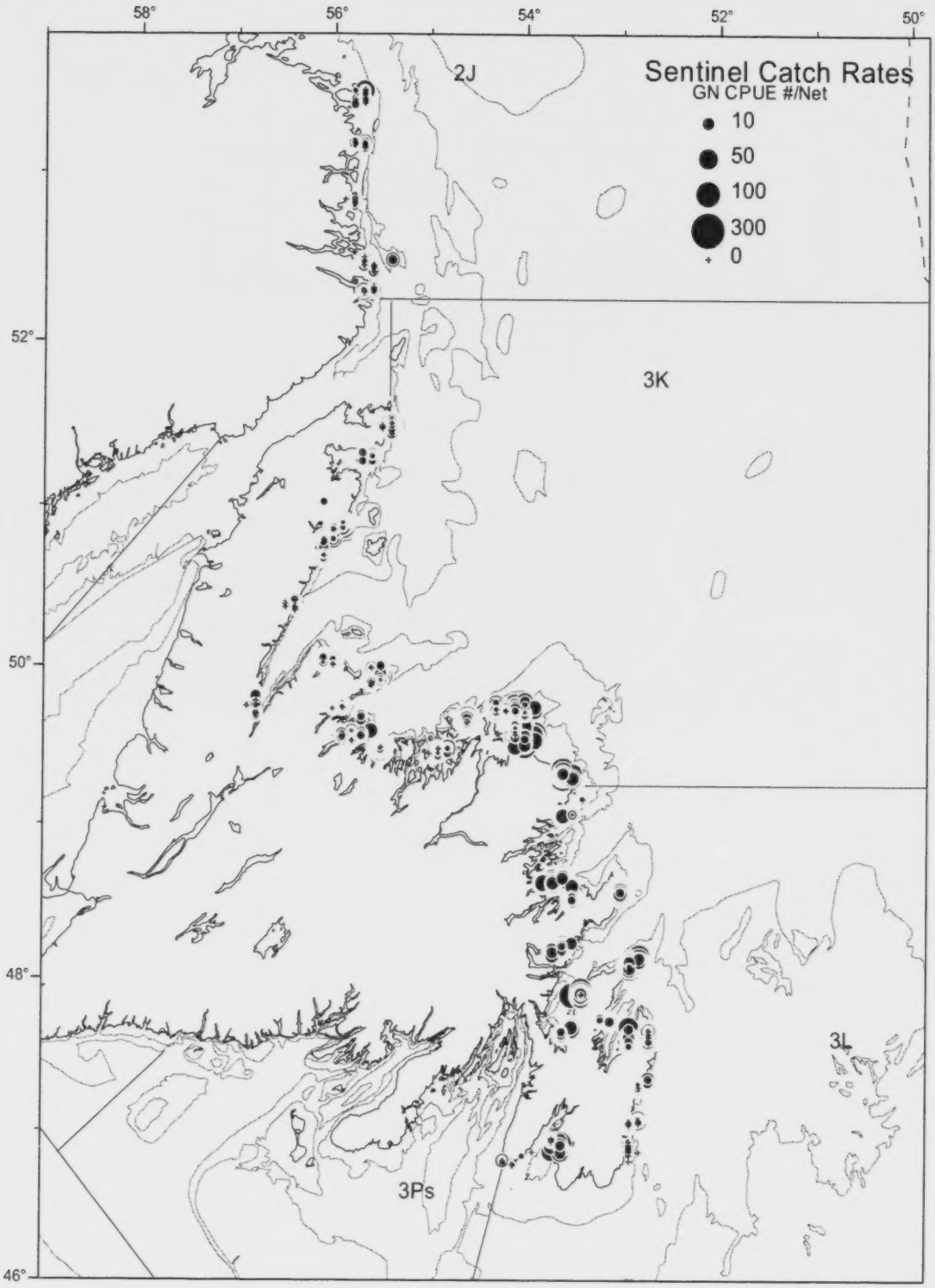


Figure 3. Sentinel survey in 2007 catch per unit effort (number of fish per net) for 5½" gillnet.

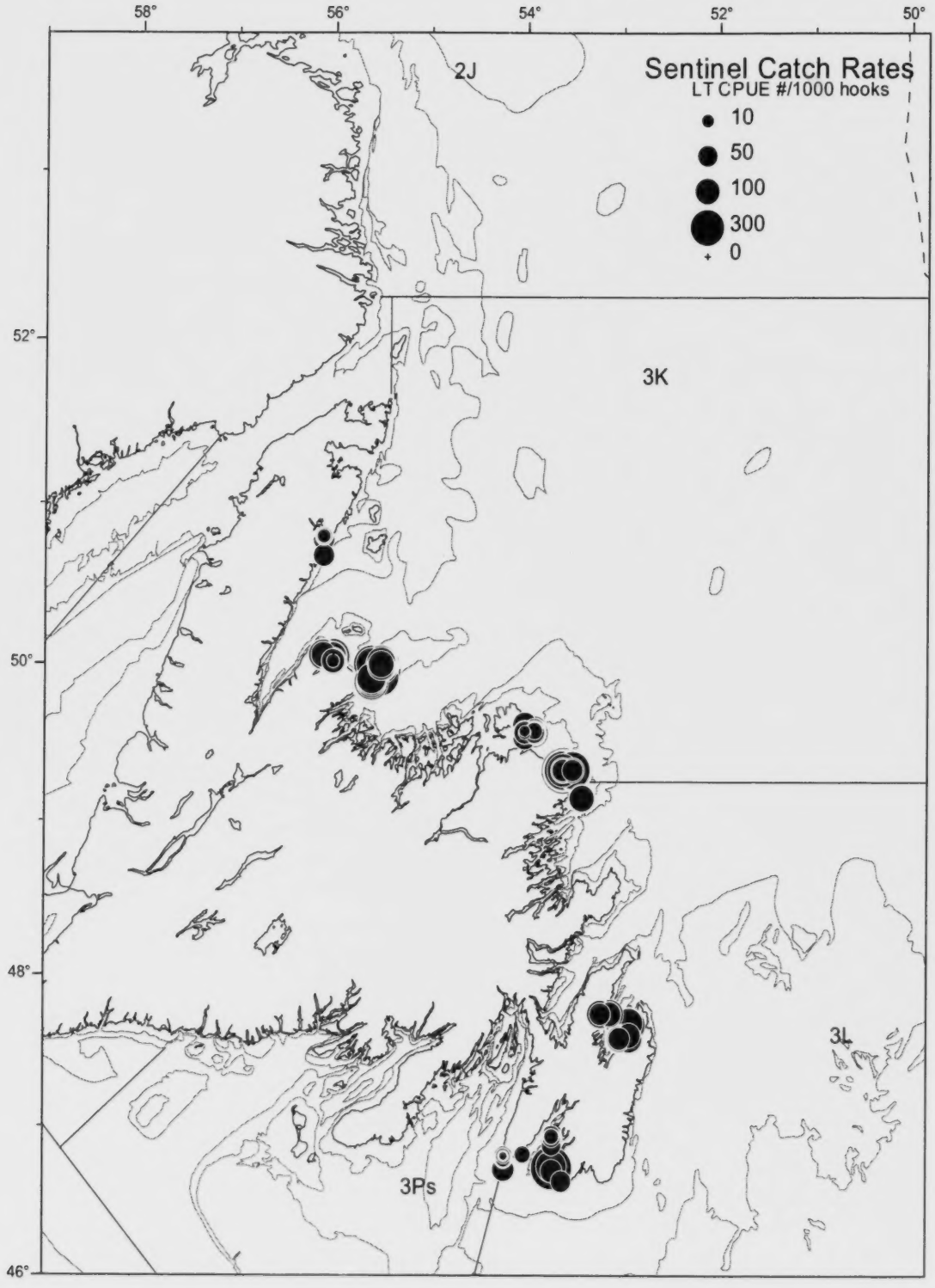


Figure 4. Sentinel survey in 2007 catch per unit effort number of fish per 1000 hooks) for linetrawl.

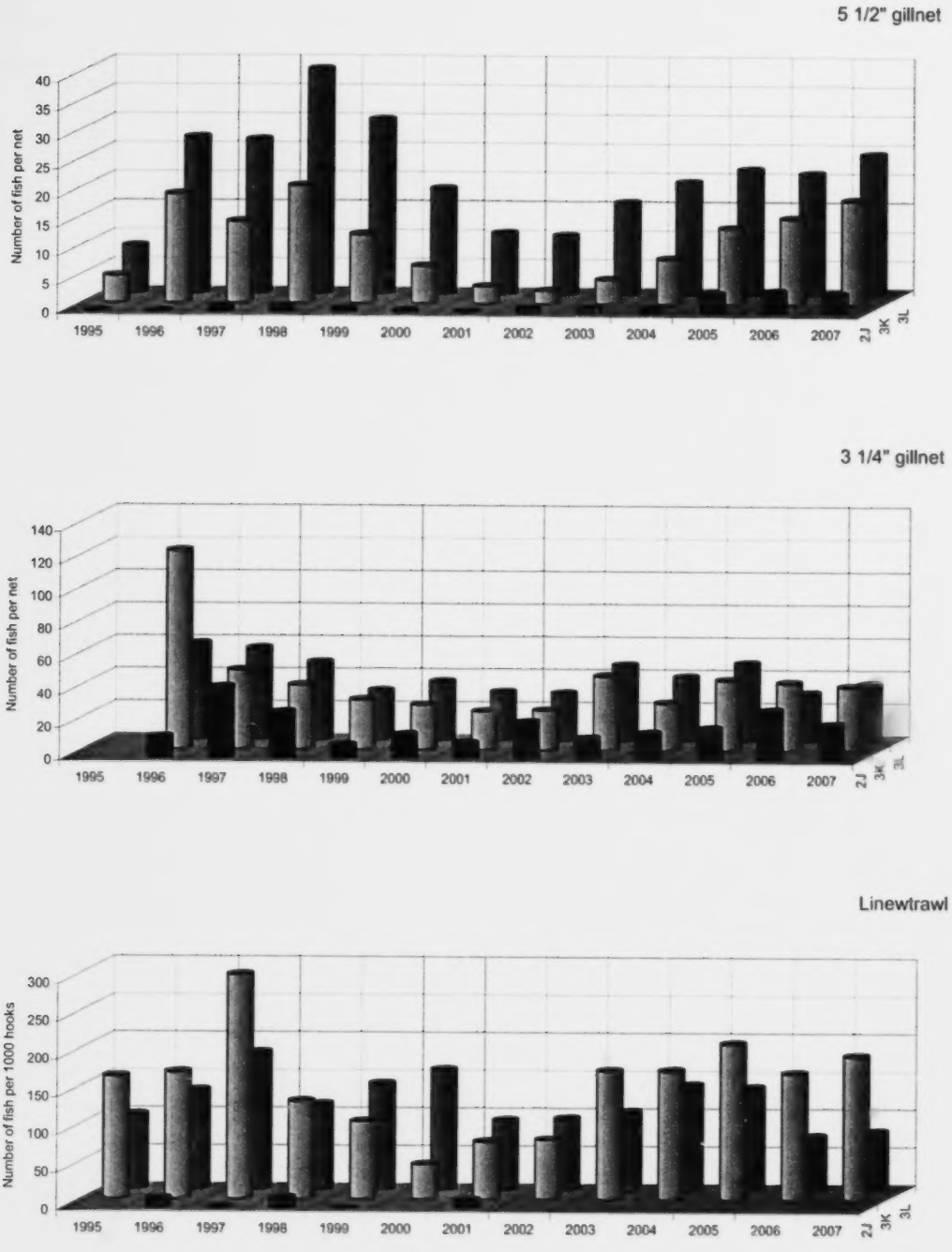


Figure 5. Mean CPUE (# of fish per net or 1000 hooks) by NAFO Division. Top panel $5^1/_2$" gillnet, middle panel $3^1/_4$" gillnet, lower panel Linetrawl.

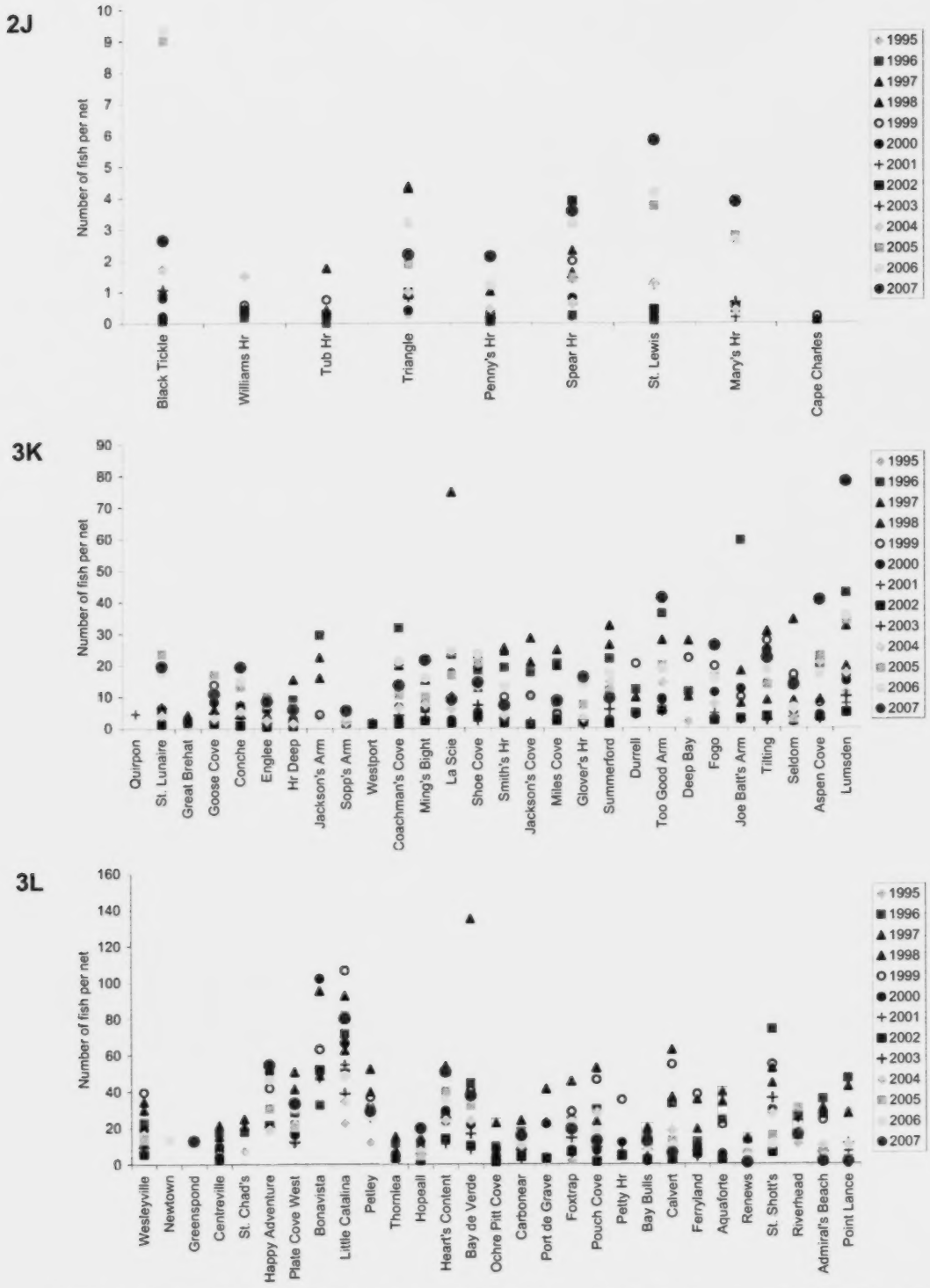


Figure 6. Mean catch per unit effort (number of fish per net) for 5½" gillnet by community. Top panel 2J, middle panel 3K, lower panel 3L.

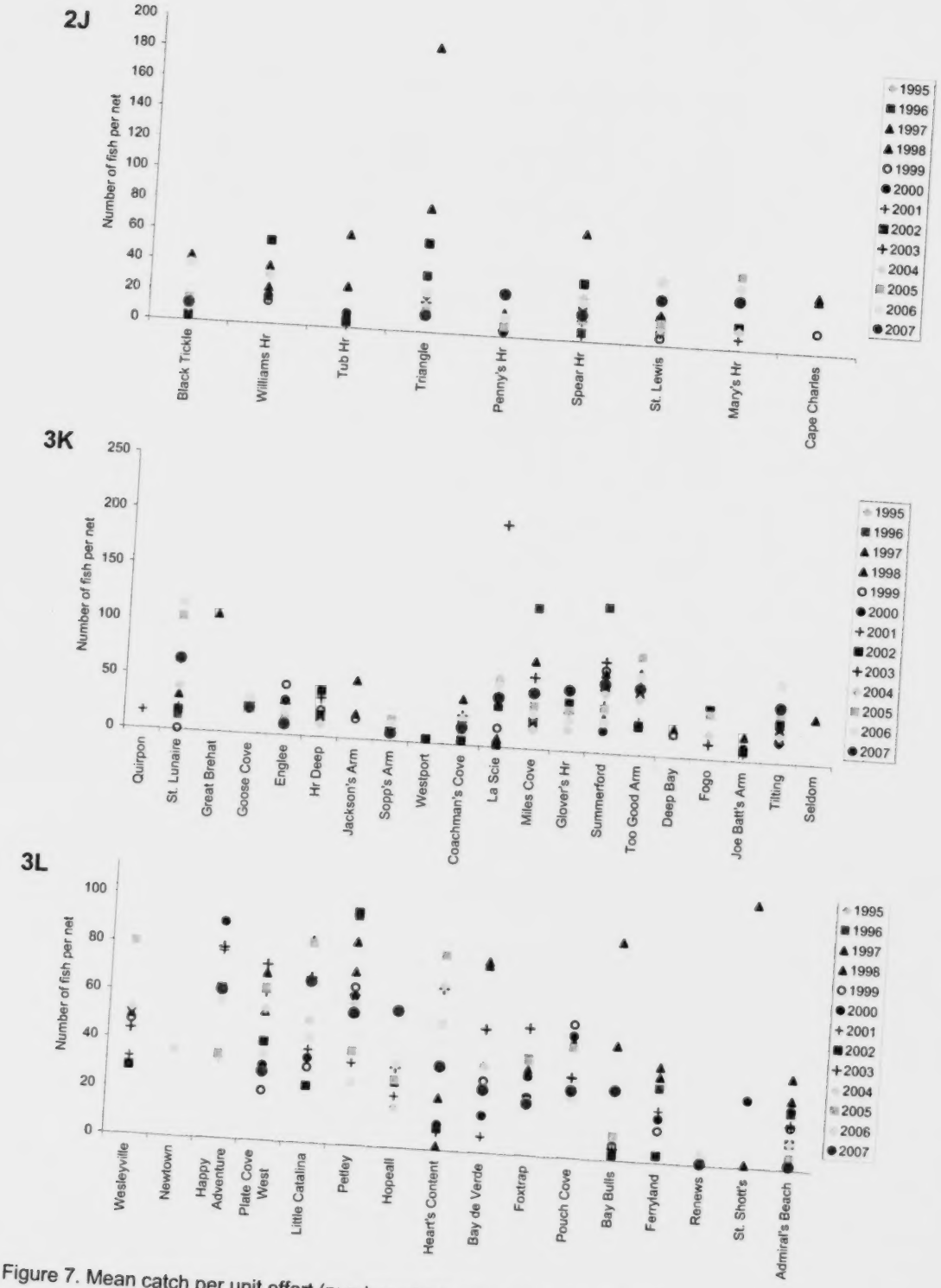


Figure 7. Mean catch per unit effort (number of fish per net) for 3¼" gillnet by community. Top panel 2J, middle panel 3K, lower panel 3L.

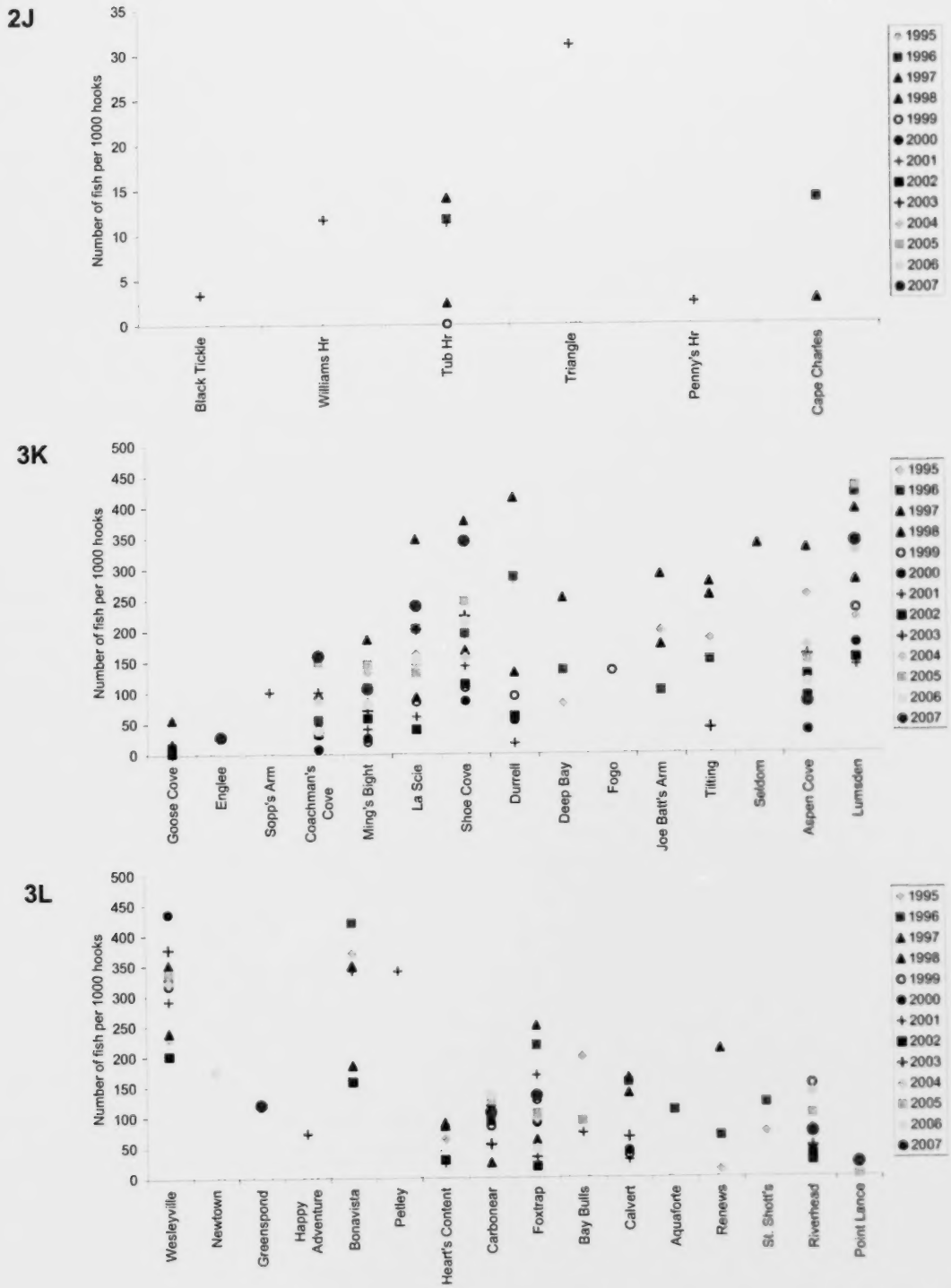


Figure 8. Mean catch per unit effort (number of fish per net) for linetrawl by community. Top panel 2J, middle panel 3K, lower panel 3L.

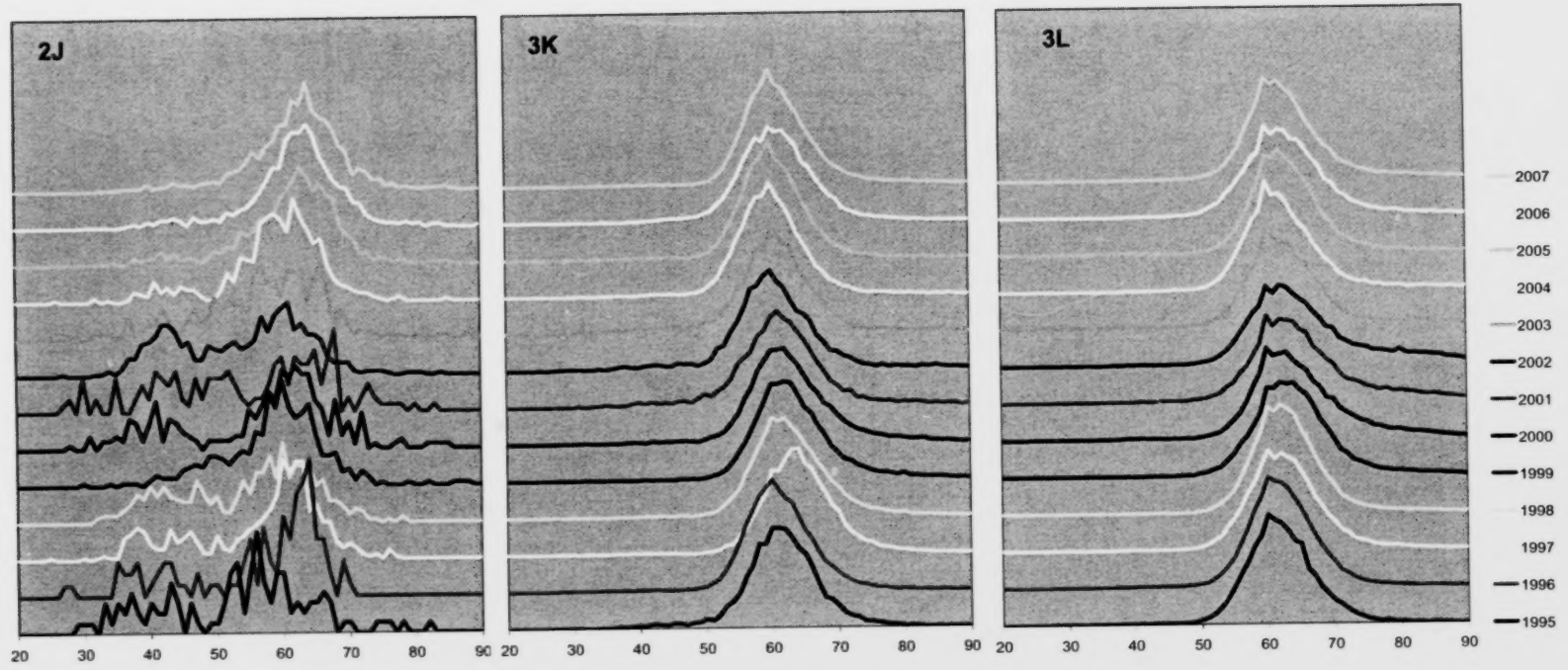


Figure 9. Length frequencies for 5 ½" gillnet from 1995 to 2007 by division. Frequencies are totaled for the division and then scaled to 1.

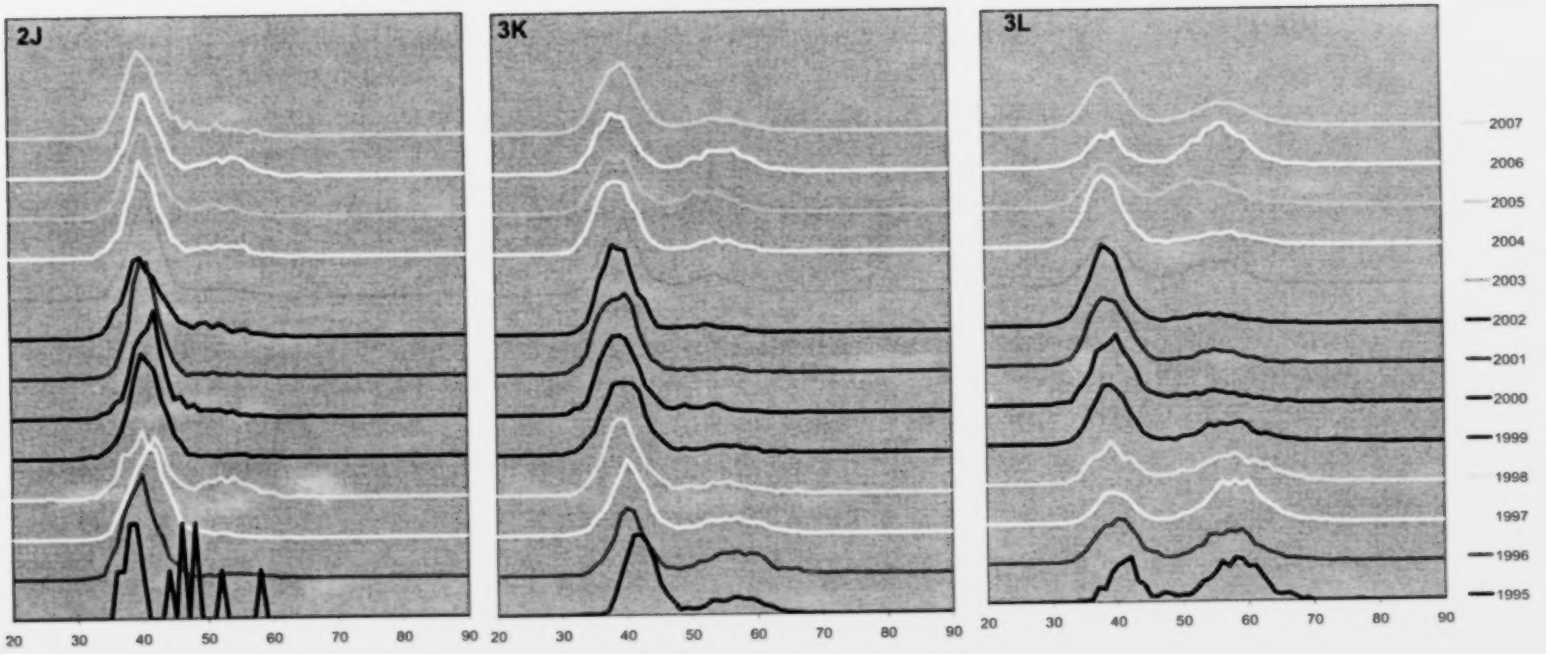


Figure 10. Length frequencies for 3 ¼" gillnet from 1995 to 2007 by division. Frequencies are totaled for the division and then scaled to 1.

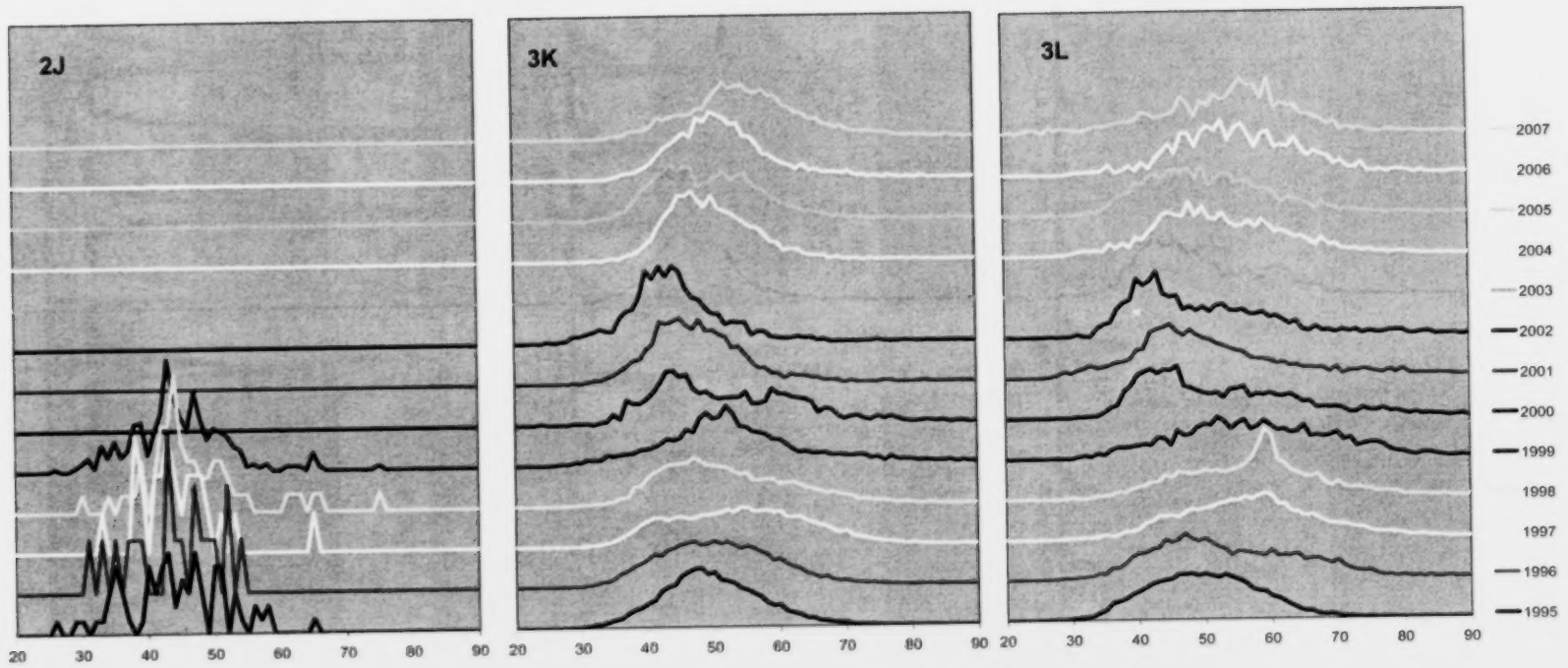


Figure 11. Length frequencies for linetrawl from 1995 to 2007 by division. Frequencies are totaled for the division and then scaled to 1.

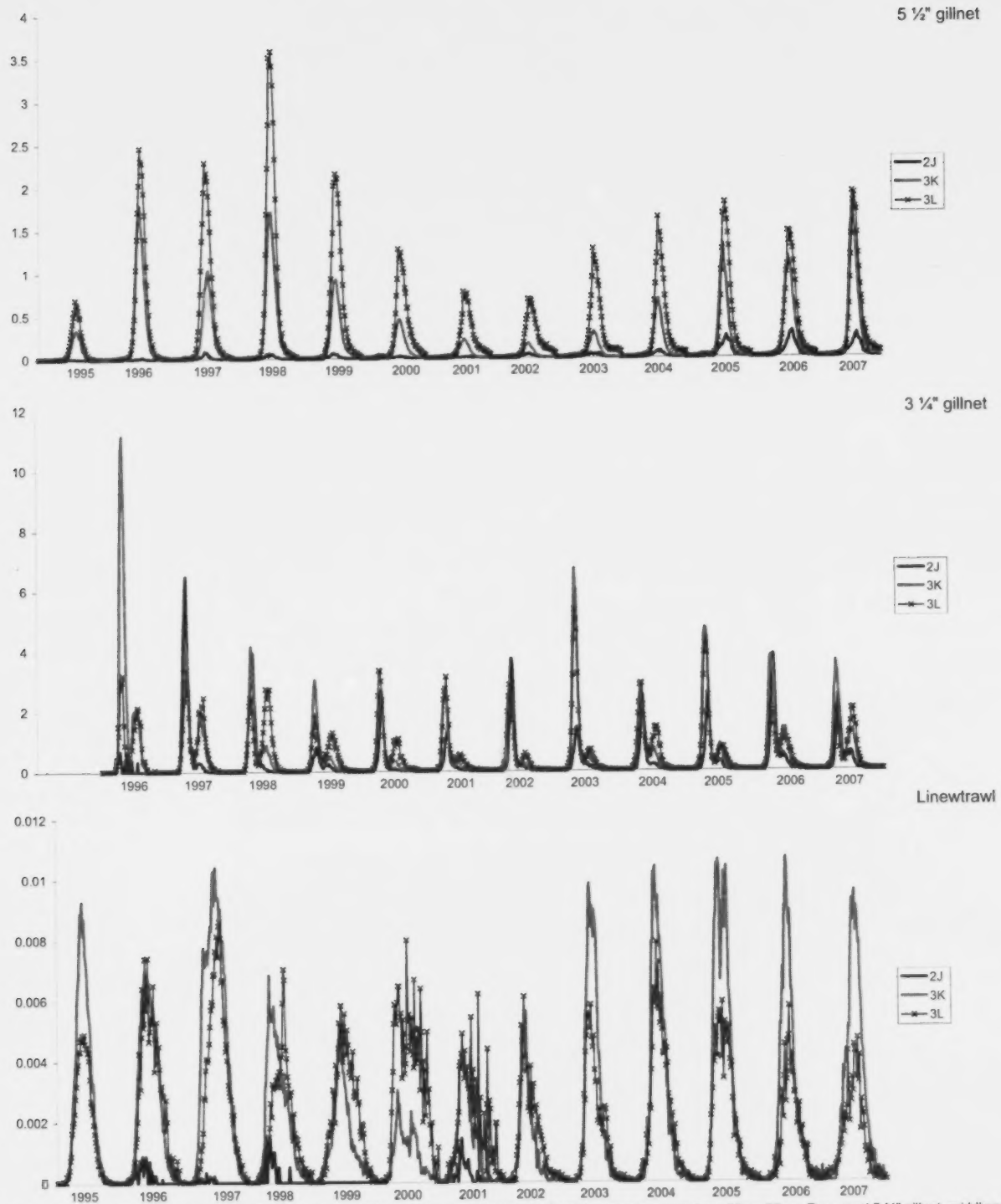


Figure 12. Length frequencies scaled to effort for gillnet and linetrawl from 1995 to 2007. Each frequency ranges from 20cm-90cm. Top panel 5 ½" gillnet, middle panel 3 ¼" gillnet, lower panel linetrawl.

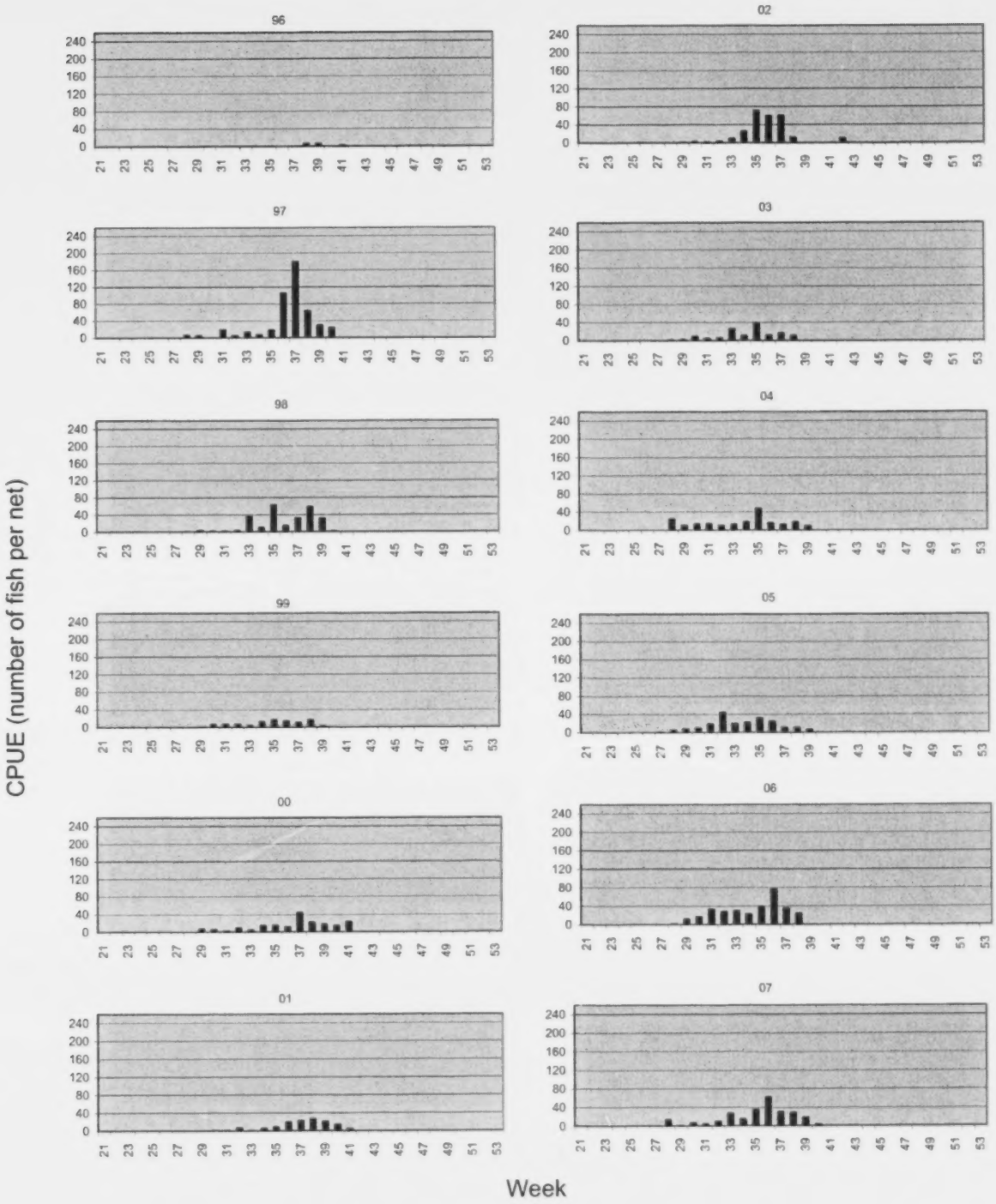


Figure 13. Average weekly small mesh gillnet catch rate (number of fish per net) for Sentinel locations in 2J 1996-2007.

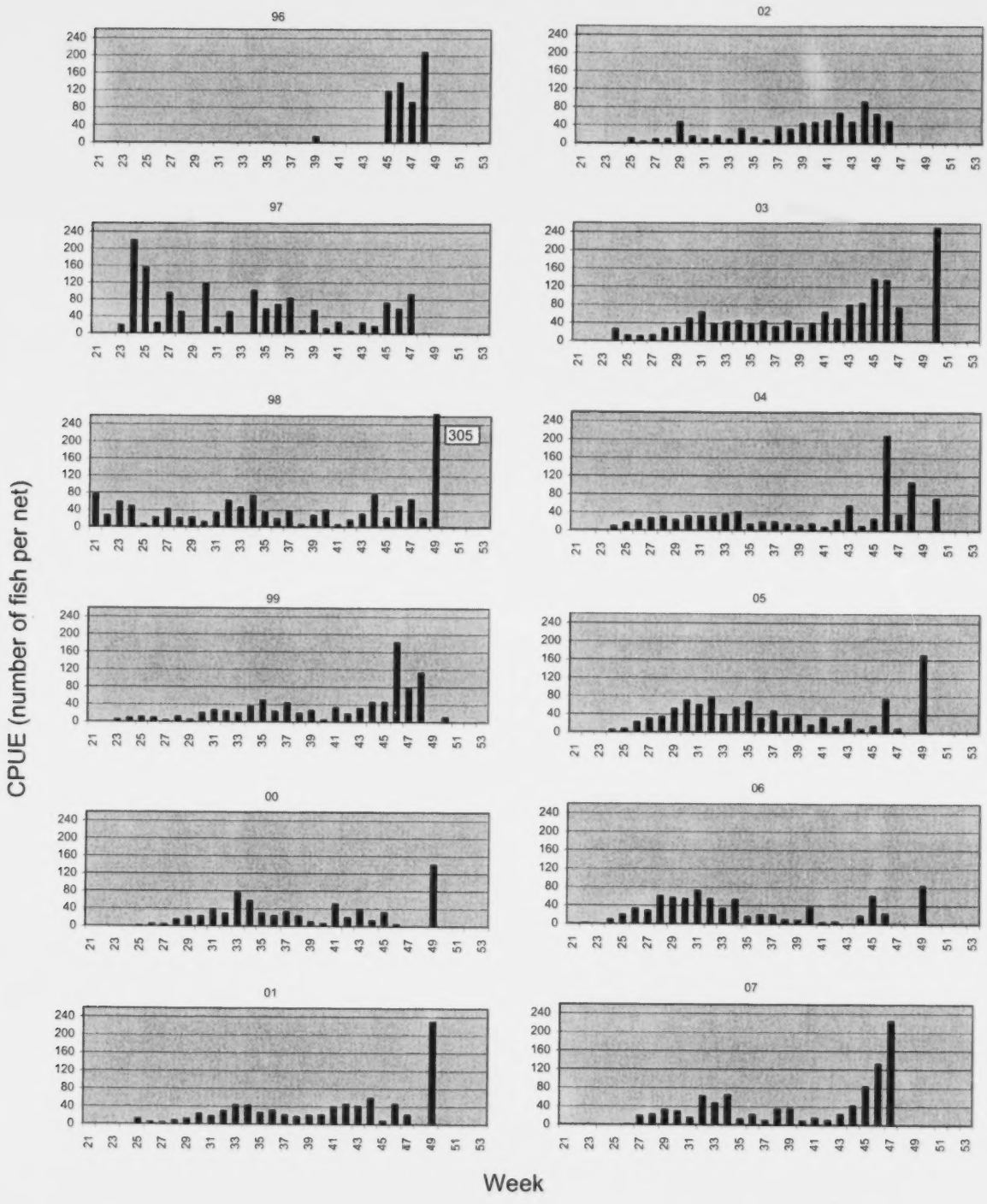


Figure 14. Average weekly small mesh gillnet catch rate (number of fish per net) for Sentinel locations in 3K 1996-2007.

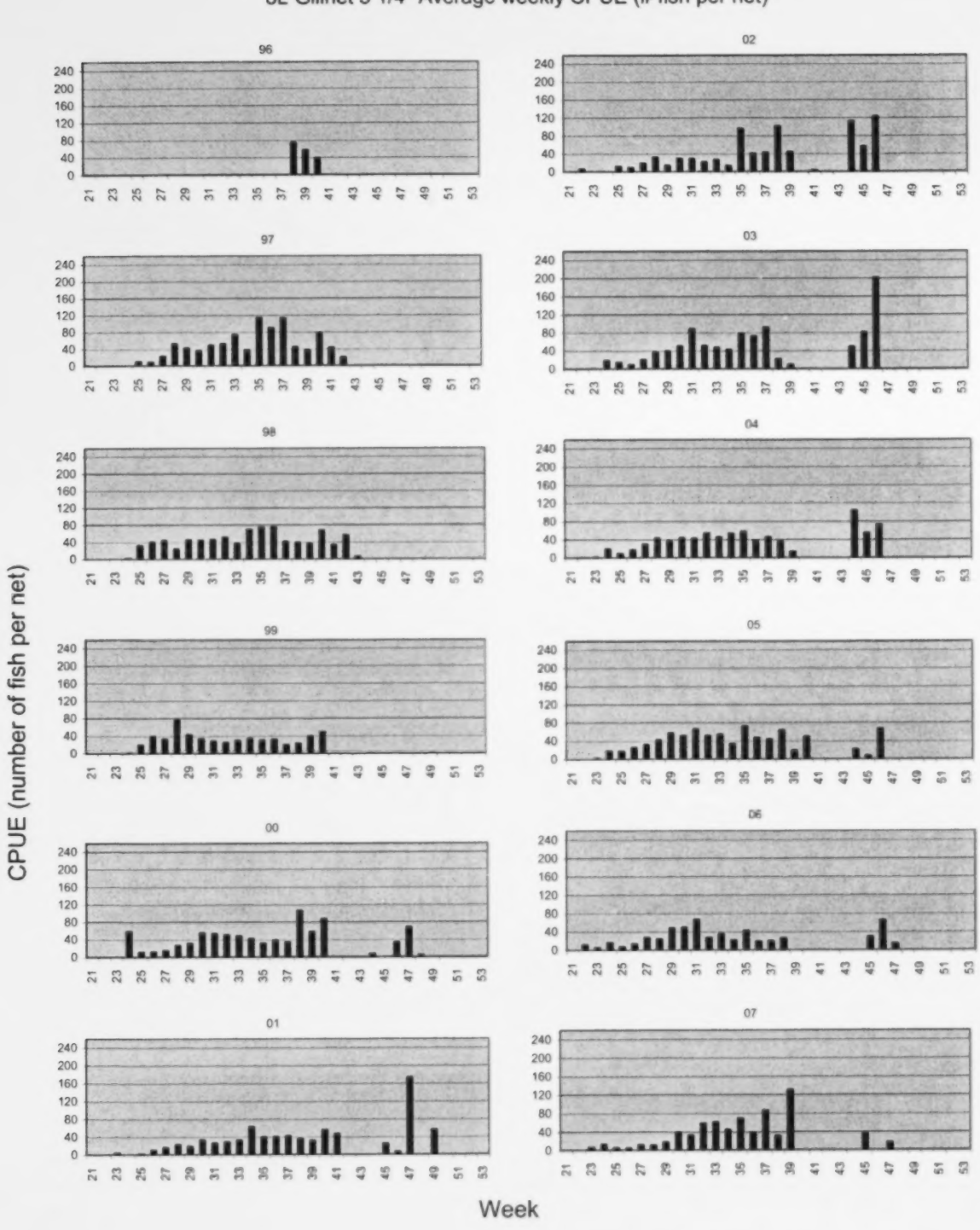


Figure 15. Average weekly small mesh gillnet catch rate (number of fish per net) for Sentinel locations in 3L 1996-2007.

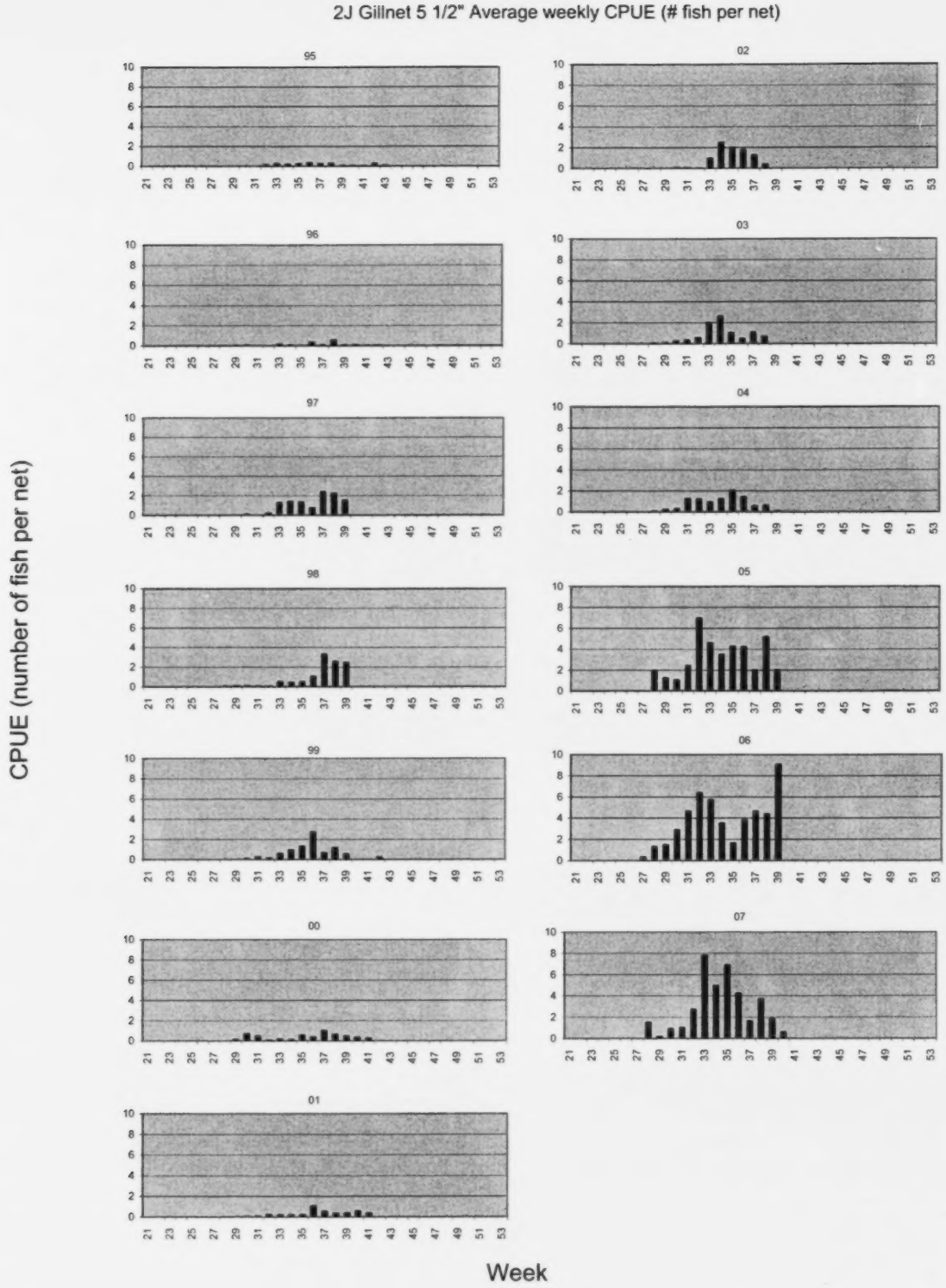


Figure 16. Average weekly gillnet catch rate (number of fish per net) for Sentinel locations in 2J 1995-2007.

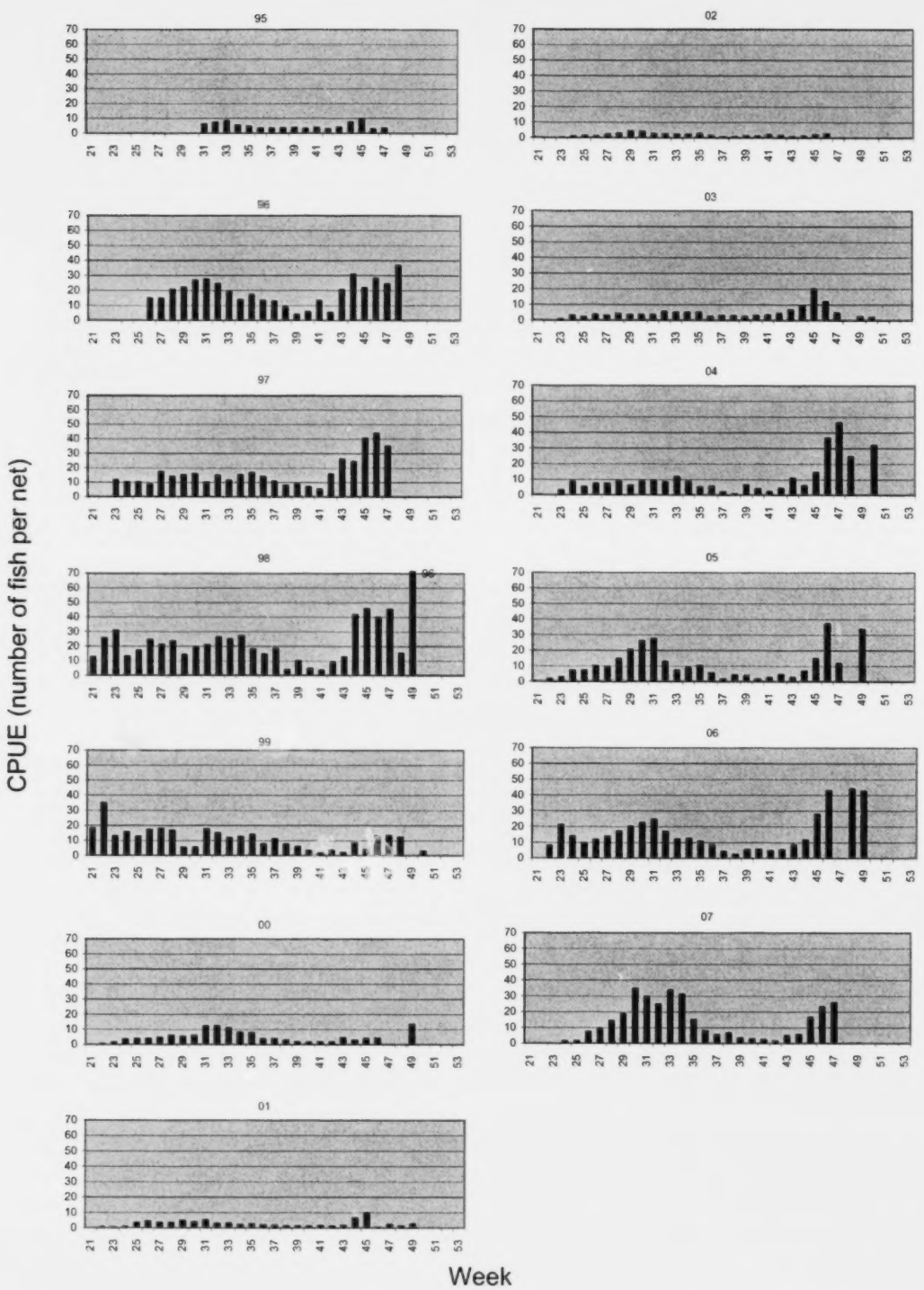


Figure 17. Average weekly gillnet catch rate (number of fish per net) for Sentinel locations in 3K 1995-2007.

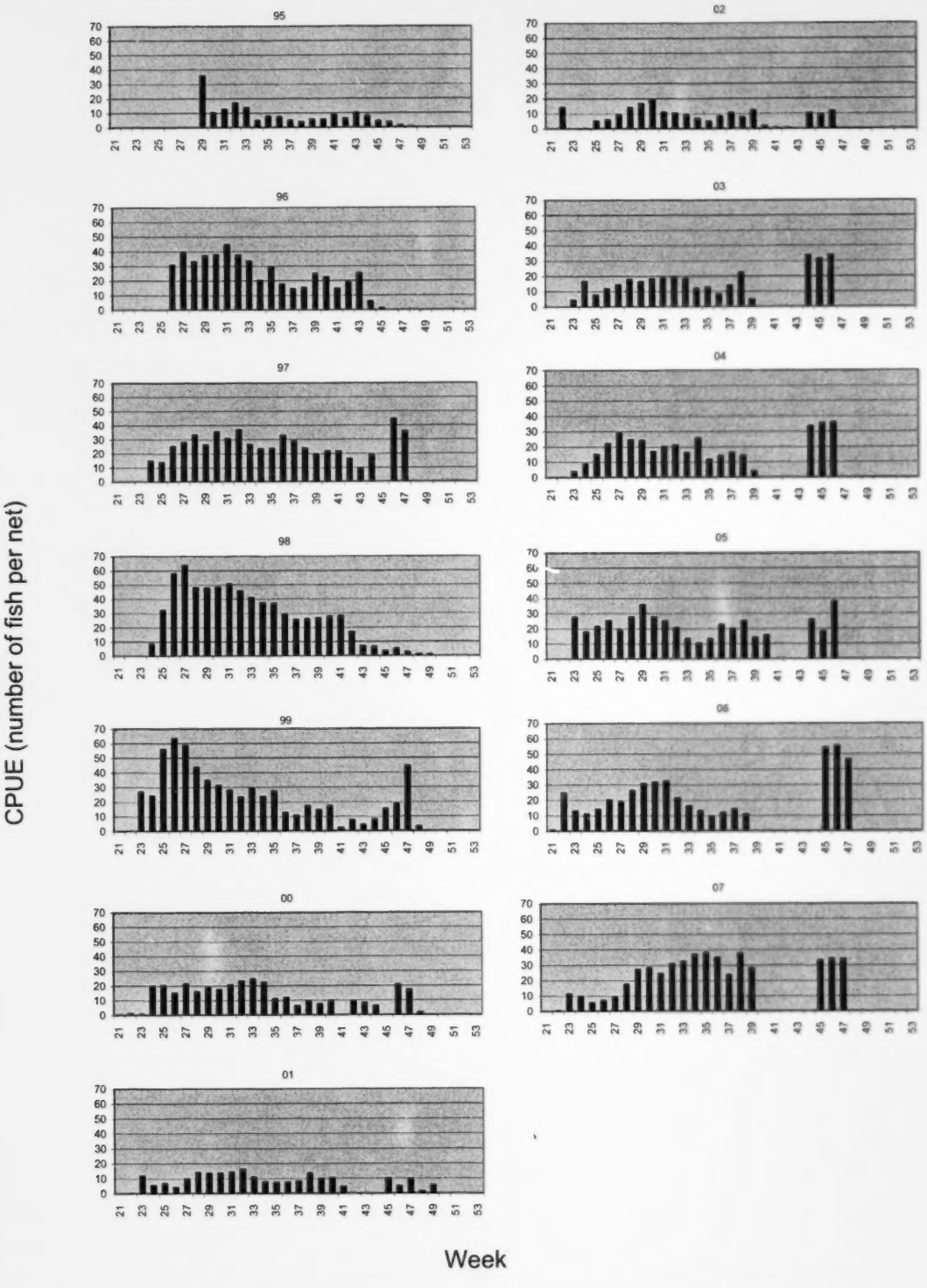


Figure 18. Average weekly gillnet catch rate (number of fish per net) for Sentinel locations in 3L 1995-2007.

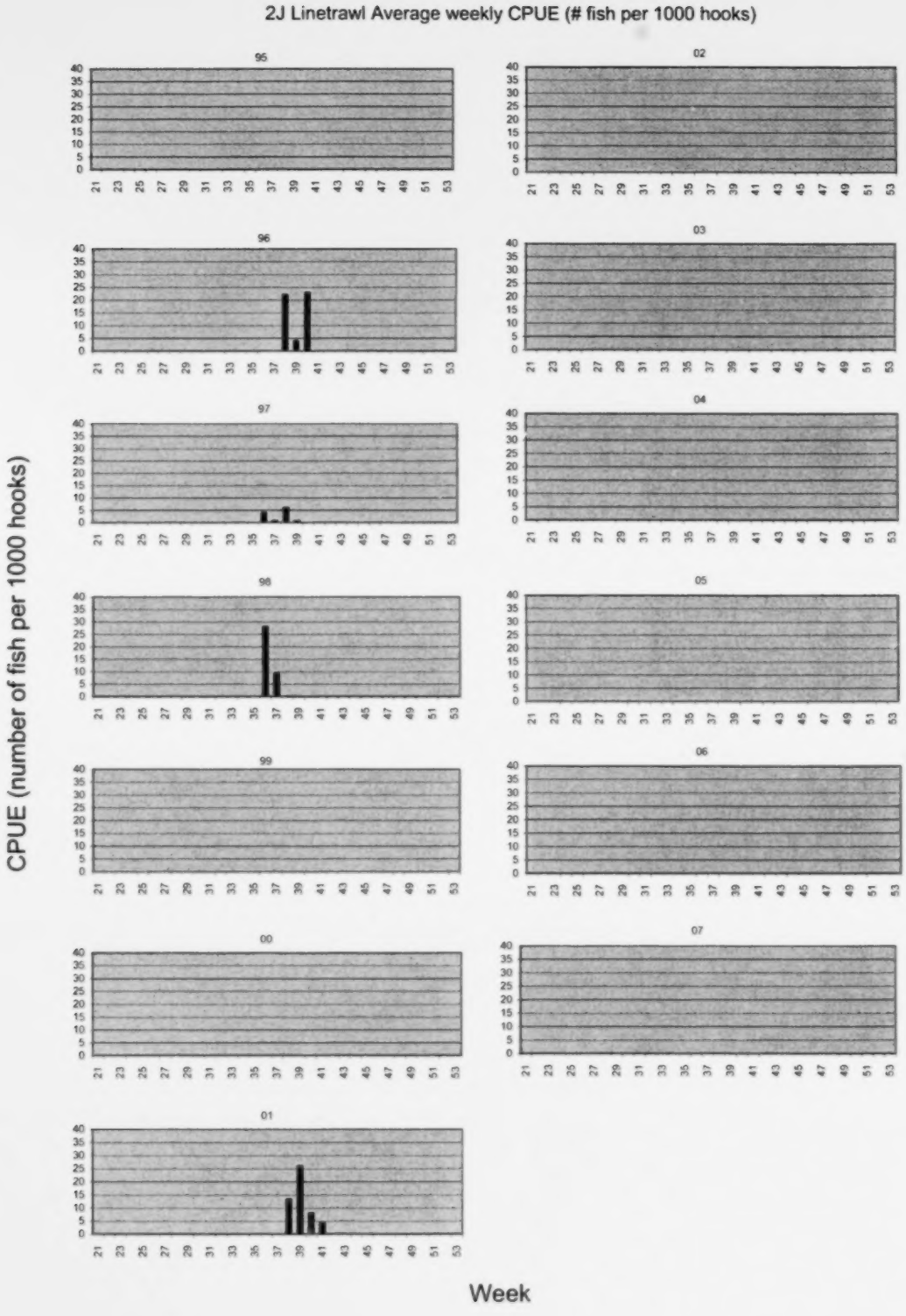


Figure 19. Average weekly linetrawl catch rate (number of fish per 1000 hooks) for Sentinel locations in 2J 1995-2007.

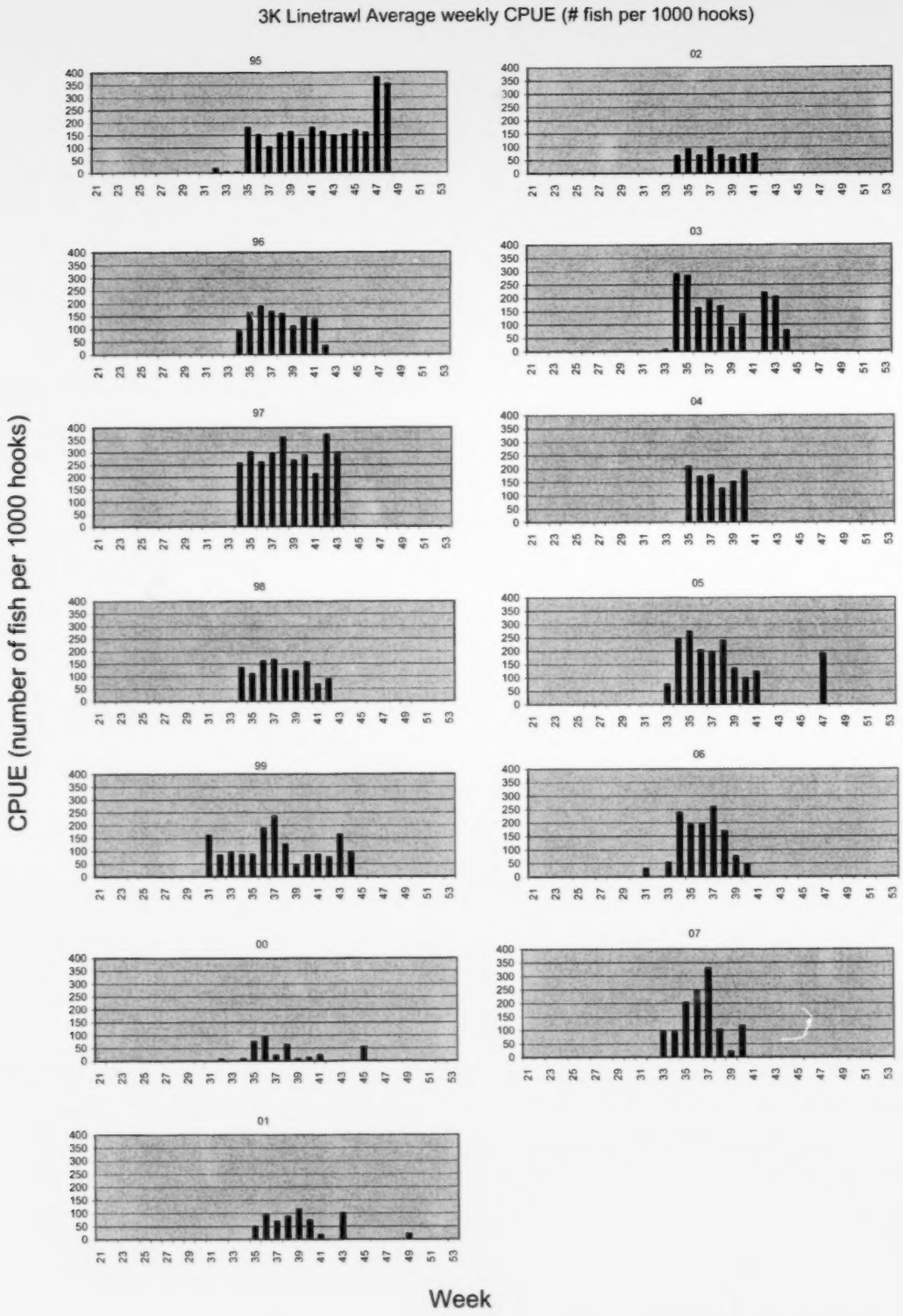


Figure 20. Average weekly linetrawl catch rate (number of fish per 1000 hooks) for Sentinel locations in 3K 1995-2007.

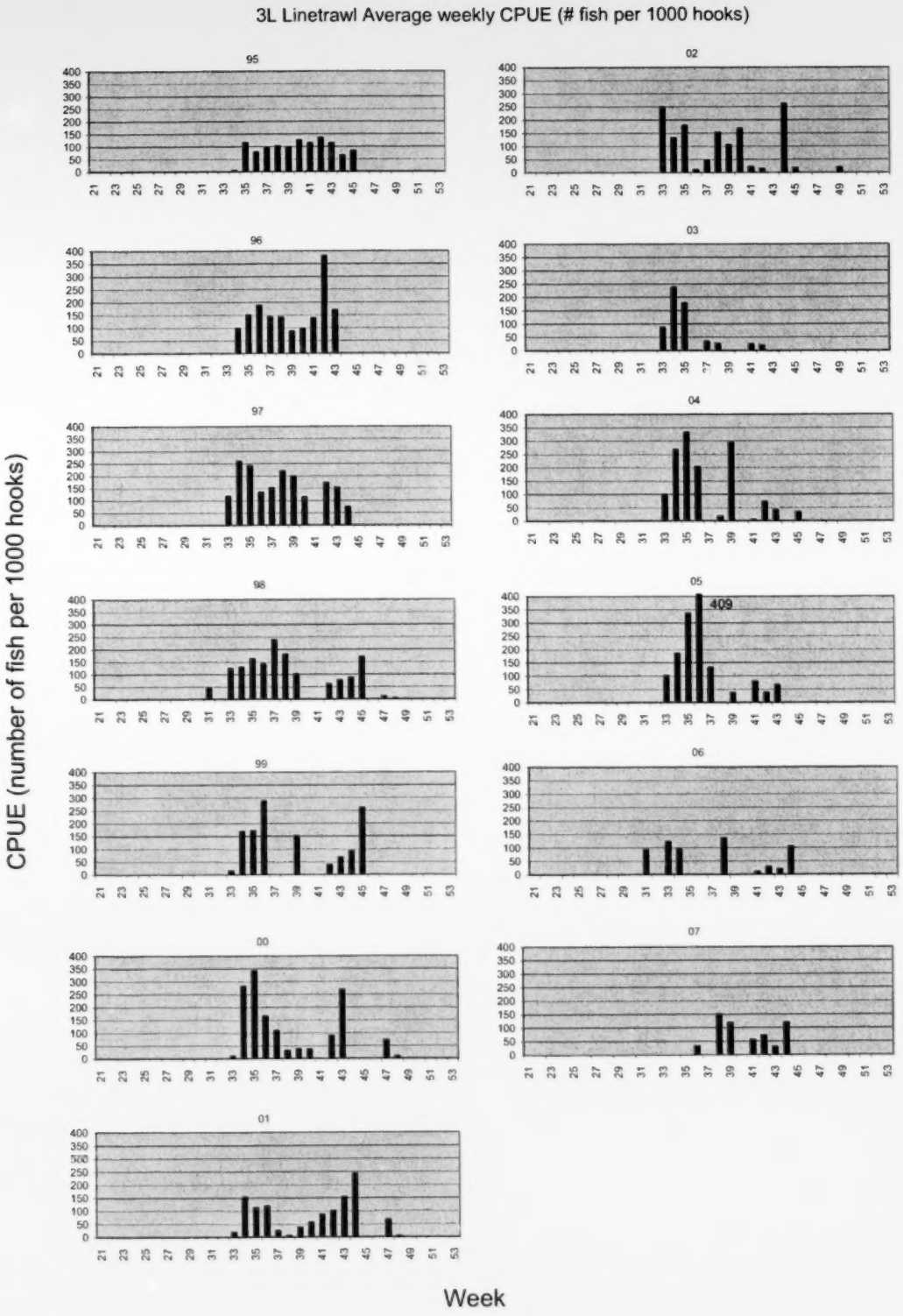


Figure 21. Average weekly linetrawl catch rate (number of fish per 1000 hooks) for Sentinel locations in 3L 1995-2007.